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2021-22 UCSC GENERAL CATALOG

Some or all instruction for all or part of Academic Year 2021-22 may be delivered remotely. Tuition and mandatory fees have been set regardless of the method of instruction and will not be refunded in the event instruction occurs remotely for any part of the Academic Year.

It is not possible to know at this time whether the COVID-19 pandemic will result in changes to operations in student housing and residential life in Academic Year 2021-2022. Consequently, we are not offering a housing guarantee.

WELCOME TO UC SANTA CRUZ

Welcome to UC Santa Cruz!

The student experience at UCSC is unique, fusing high academic standards with a passion for transformative engagement in the world. This experience is shaped by exceptional faculty whose work is at the forefront of their fields and who are invested in helping students grow their own intellectual interests. As a result, UCSC is routinely ranked among the top universities in the world for research excellence and impact, and our students have opportunities to collaborate with top scholars and scientists in the creation of new knowledge.

But what defines UCSC is not just academic excellence or our spectacular campus. It is our diverse community. The motto of UCSC's first residential college is "the pursuit of truth in the company of friends." Since 1965, UCSC has been the site of innovation and experimentation about what a university community could and should be. Today, our residential college system provides flexible support and opportunities aimed at recognizing the student as a whole person and prioritizing their success. Only through community can we realize the responsibilities we have to one another, and the ways the pursuit of knowledge can improve the lives of our many communities — local, national, and global.

I encourage you to take advantage of all of the opportunities that UCSC has to offer. There is so much to learn about — from the depths of the ocean to the farthest stars and



everything in between.

I welcome you to UC Santa Cruz, which is not just a place, but a community of learning that spans the world.

Sincerely,

A handwritten signature in cursive script that reads "Cynthia Larive".

Cynthia Larive

Chancellor

INTRODUCING UC SANTA CRUZ

THE UNIVERSITY OF CALIFORNIA

The University of California opened its doors in 1869 with just 10 faculty members and 38 students, and it has since developed into one of the world's most distinguished university systems. Acclaimed for its research, scholarship, and dedication to undergraduate and graduate education, the UC system improves the lives of people in California and around the world through world-class educational opportunities, groundbreaking research, top-rated health care, and agricultural expertise.

Ten University of California campuses are located regionally throughout the state, and the system also includes five medical centers, three national laboratories, and more than 800 associated research institutes, laboratories, agricultural field stations, and extension centers.

The University of California includes more than 280,380 students and more than 227,700 faculty and staff. More than 2 million UC alumni live and work around the world. UC faculty include 64 Nobel prizes and more than 60 National Medals of Science. UC academics include more than 600 members of the National Academy of Sciences. Detailed information about the University of California's teaching, research, and public service mission is available at the University of California website.

THE UC SANTA CRUZ CAMPUS

Established in 1965, the University of California, Santa Cruz, is dedicated to excellence in undergraduate education, graduate studies, and research. Named to the 2017 US News & World Report top 50 Best Global Universities list, the campus has earned national and international recognition both for the impact of its research and for its long-established commitment to quality undergraduate instruction. UC Santa Cruz combines the facilities and resources of a world-class public research university with a distinctive undergraduate experience characterized by our college system. A strong program of general education is enhanced with opportunities for academic specialization and original research, and UC Santa Cruz also provides unparalleled opportunities for students to learn through hands-on experience. Strong commitments to environmental stewardship and community engagement are also central to the campus's core values.

Fall enrollment for the 2020-21 academic year was 12,685 students, of whom 1,490 were graduate students. UC Santa Cruz seeks and welcomes students, faculty, and staff of diverse ethnic and cultural experiences and is dedicated to enrolling a student body that reflects the state's ethnic and socioeconomic diversity. UC Santa Cruz is a Hispanic Serving Institution member of the Hispanic Association of Colleges and Universities, with approximately 25 percent of undergraduates identifying as Hispanic or Latino (fall 2020).

The UC Santa Cruz faculty includes two of the University of California's honored University Professors, 25 members of the American Academy of Arts and Sciences, 12 members of the National Academy of Sciences, and 36 fellows of the American Association for the Advancement of Science. Five faculty members have been awarded MacArthur "Genius" awards. UCSC faculty and researchers have received more than \$100 million annually in external funding over the past five years, totaling more than \$1.2 billion over the past 10 years. More information about our distinguished faculty may be found in the UCSC Newscenter.

The 10 residential colleges are supportive living and learning communities that characterize the UC Santa Cruz experience. All undergraduate students, whether they live in university housing or not, are affiliated with one of the colleges. Self-contained and architecturally distinct, each college is a relatively small community of 30 to 110 faculty members and between 1,500 and 1,800 students, about half of whom typically live on campus. In addition to housing students in small-scale residential communities, each college provides academic support, organizes student activities, and sponsors events that enhance the intellectual and social life of the campus.

Each college has a distinctive quality derived from its core course and extracurricular programs and from its faculty fellows and their academic disciplines. However, all of the colleges are interdisciplinary, and all academic majors are open to students from all colleges. Detailed descriptions of the 10 colleges can be found in The Colleges (p. **Error! Bookmark not defined.**) section of the catalog.

Undergraduate education. The campus offers more than 65 undergraduate majors in the arts, engineering, humanities, physical and biological sciences, and social sciences—as well as interdisciplinary major programs and minors. A complete list of academic programs and concentrations appears on the Fields of Study chart (p. 7), and detailed descriptions begin in the Academic Programs (p. **Error! Bookmark not defined.**) section of the catalog.

The major and minor programs are administered by departments within the academic divisions. In most cases, departments are composed of faculty in the same field, but interdisciplinary programs draw on faculty from several fields.

Undergraduate education at UC Santa Cruz is focused on student success. The college core courses give first-year students a small-seminar experience, including intensive work in reading, discussion, and critical reasoning, while also providing an orientation to academic life. With few exceptions, letter grades are assigned in all credit-bearing courses. In addition, academic performance in each course may be recorded by an optional narrative performance evaluation. See Evaluating Academic Performance (p. **Error! Bookmark not defined.**) for additional information.

Original undergraduate research is encouraged, and hundreds of research papers co-authored by UC Santa Cruz undergraduates and their professors have been published in journals. For additional information, visit the Undergraduate Research Opportunities website.

Global Engagement programs at UC Santa Cruz include Study Abroad opportunities and International Student and Scholar Services (ISSS). Global Engagement facilitates the exchange of people, ideas, and knowledge to support and promote the internationalization of teaching, learning, and research. Each year more than 500 UC Santa Cruz students broaden their academic horizons through the UC Education Abroad Program (UCEAP), which enables students to incorporate full-time study abroad as UC credit toward their degrees. The UC Santa Cruz campus also strongly encourages undergraduate students to take advantage of the many opportunities for public service, such as those provided through the campus's field programs, colleges, and Career Center. Individual studies, apprentice teaching, field studies, and internships can be important parts of the undergraduate experience (see Field Programs (p. **Error! Bookmark not defined.**)).

Graduate education. UC Santa Cruz offers graduate study in more than 60 degree tracks, incorporating a range of options for concentrated study in a specialized field. Graduate study at UC Santa Cruz emphasizes close interaction between faculty and students, independent student research, supervised teaching experience, and interdisciplinary work. Further graduate program information is provided in the Academic Programs (p. **Error! Bookmark not defined.**) and Graduate Information (p. **Error! Bookmark not defined.**) (p. **Error! Bookmark not defined.**) sections of the catalog.

Research. The UC Santa Cruz campus hosts a number of major research units. UC Observatories, the Santa Cruz Institute for Particle Physics (SCIPP), and the Institute of Marine Sciences conduct state-of-the-art research on topics ranging from the discovery of planets outside our solar system, to the detection of new sub-atomic particles, to the ecology of marine mammals. UC Santa Cruz is also a primary partner in inter-UC campus initiatives—such as the Institute for Quantitative Biomedical Research (QB3) and the Center for Information Technology Research in the Interest of Society (CITRIS)—which focus on human health and the use of information technology to solve social, environmental, and health-care problems.

The Humanities Institute is a hub for academic research, cross-discipline collaboration, and public engagement that oversees a range of topical centers, including the Center for Cultural Studies, the Center for Jewish Studies, the Center for Public Philosophy, the Linguistics Research Center, and the Dickens Project. Research enterprises within the arts benefit from the Arts Research Institute and the Center for Documentary Arts and Research, while the Institute of the Arts and Sciences emphasizes interdisciplinary exhibitions, events, and residency programs. The Center for Agroecology and Sustainable Food Systems, the Center for Integrated Spatial Research, the Chicano/Latino Research Center, and the Science & Justice Research Center provide pioneering

directions for research in the social sciences. Engineering at UC Santa Cruz has focused on strategic initiatives that include the UC Santa Cruz Genomics Institute, the Institute for the Biology of Stem Cells, the Center for Games and Playable Media, and the Center for Sustainable Energy and Power Systems. Beyond these organized research enterprises, UC Santa Cruz has a wide suite of investigator-driven research that spans the width and breadth of campus inquiry. For additional information see Resources for Learning and Research (p. **Error! Bookmark not defined.**).

Location and facilities. The main UC Santa Cruz campus occupies 2,000 acres on the west side of the city of Santa Cruz, on Monterey Bay, about 75 miles south of San Francisco and 35 miles southwest of San José. Expansive meadows at the campus entrance gradually slope up to a redwood forest that covers most of the site. Each residential college is within easy access of the campus's central core, which includes library facilities, science laboratories, lecture halls, art studios, theater arts and music centers, a student union, and athletic facilities. Although the campus is spread out over many acres of hilly terrain, its programs are accessible to people with mobility impairments (see Disability Resource Center).

The UC Santa Cruz Coastal Science Campus, located on the edge of the Monterey Bay National Marine Sanctuary, provides extensive research and education facilities focused on marine and environmental sciences.

The city of Santa Cruz is a well-known recreational area and center for the arts. Mild weather, miles of beaches, and many cultural opportunities combine to make Santa Cruz an enjoyable place to study and live.

Accreditation. The University of California, Santa Cruz, is accredited by the Accrediting Commission for Senior Colleges and Universities of the Western Association of Schools and Colleges (WASC), 1001 Marina Village Parkway, Suite 402, Alameda, CA 94501, (510) 748-9001, an institutional accrediting body recognized by the Council for Higher Education and the U.S. Department of Education.

Specific degree programs at UC Santa Cruz are also accredited: The Engineering Accreditation Commission of ABET, <http://www.abet.org> (Electrical Engineering); the American Chemical Society Committee on Professional Training (Chemistry); and the California State Commission on Teacher Credentialing (Education). To review accreditation documents, please contact the Office of the Vice Provost for Academic Affairs, Kerr Hall, (831) 459-1349, or vpaa@ucsc.edu.

ACADEMIC PROGRAMS

BACHELOR'S DEGREES

UNDERGRADUATE MINORS

BACHELOR'S/MASTER'S CONTIGUOUS PATHWAYS

MASTER'S DEGREES

PH.D. DEGREES

DESIGNATED EMPHASES

FIELDS OF STUDY CHART

Agroecology (p. **Error! Bookmark not defined.**)

Anthropology (p. **Error! Bookmark not defined.**)

Archaeology

Cultural Anthropology

Biological Anthropology

Applied Economics and Finance (p. **Error! Bookmark not defined.**)

Applied Linguistics and Multilingualism (p. **Error! Bookmark not defined.**)

Applied Mathematics (p. **Error! Bookmark not defined.**)

Applied Physics (p. **Error! Bookmark not defined.**)

Art (p. **Error! Bookmark not defined.**)

Art and Design: Games
and Playable Media (p. **Error! Bookmark not defined.**)

Assistive Technology (p. **Error! Bookmark not defined.**)

Astronomy and Astrophysics (p. **Error! Bookmark not defined.**)

Undergraduate Education			Graduate Education			
B.A.	B.S.	Minor	M.A/M.F.A.	M.S.	Ph.D.	Designated Emphasis
x						
x		x			x	x
					c	
					c	
					c	
				x		
x						
	x	x		x	x	
	x					
x						
x						
		x				
					x	

Astrophysics (p. **Error! Bookmark not defined.**)

Bioelectronics/Biophotonics (p. **Error! Bookmark not defined.**)

Biochemistry and Molecular Biology (p. **Error! Bookmark not defined.**)

Bioinformatics (p. **Error! Bookmark not defined.**)

Biology (p. **Error! Bookmark not defined.**)

Biomolecular Engineering and Bioinformatics (p. **Error! Bookmark not defined.**)

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Bioinformatics

Biomolecular Engineering

Biotechnology (p. **Error! Bookmark not defined.**)

Black Studies (p. **Error! Bookmark not defined.**)

Business Management Economics (p. **Error! Bookmark not defined.**)

Accounting

Chemistry (p. **Error! Bookmark not defined.**)

Biochemistry

Classical Studies (p. **Error! Bookmark not defined.**)

Coastal Science and Policy (p. **Error! Bookmark not defined.**)

Undergraduate Education			Graduate Education			
		x				
		x				
	x					
		x				
x	x	x				
	x			x	x	
	c					
	c					
x						
		x				
x						
	c					
x	x	x		x	x	
	c					
x		x				
				x		x

Cognitive Science (p. **Error! Bookmark not defined.**)

Community Studies (p. **Error! Bookmark not defined.**)

Computational Media (p. **Error! Bookmark not defined.**)

Computer Engineering (p. **Error! Bookmark not defined.**)

Computer Systems

Digital Hardware

Networks

Systems Programming

Computer Science (p. **Error! Bookmark not defined.**)
2

Computer Science: Computer Game Design (p. **Error! Bookmark not defined.**)

Computer Science and Engineering (p. **Error! Bookmark not defined.**)
2

Critical Race and Ethnic Studies (p. **Error! Bookmark not defined.**)

Data Science (p. **Error! Bookmark not defined.**)

Digital Arts and New Media (p. **Error! Bookmark not defined.**)
3

Earth Sciences (p. **Error! Bookmark not defined.**)
18

Geology

Geophysics

Ocean Sciences

Undergraduate Education			Graduate Education			
	x					
x						
				x	x	x
	x	x				
	c					
	c					
	c					
	c					
x	x	x				
	x					
				x	x	
x						x
						x
			x			
	x	x		x	x	
	c					
	c					
	c					

Planetary Sciences

Earth Sciences / Anthropology Combined B.A. (p. **Error! Bookmark not defined.**)

East Asian Studies (p. **Error! Bookmark not defined.**)

Ecology and Evolution (p. **Error! Bookmark not defined.**)

Ecology and Evolutionary Biology (p. **Error! Bookmark not defined.**)
17

Economics (p. **Error! Bookmark not defined.**)

Economics / Mathematics Combined B.A. (p. **Error! Bookmark not defined.**)

Education (p. **Error! Bookmark not defined.**)
4, 6, 16

Bilingual-Multicultural Education

Multiple Subjects Credential (elementary)

Single Subjects Credential (secondary)

Education, Democracy, and Justice (p. **Error! Bookmark not defined.**)

Education: Science, Technology, Engineering, and Mathematics (p. **Error! Bookmark not defined.**)

Electrical Engineering (p. **Error! Bookmark not defined.**)

Electronics/Optics

Communications, Signals, Systems, and Controls

Electrical and Computer Engineering (p. **Error! Bookmark not defined.**)

Undergraduate Education			Graduate Education			
	c					
x						
		x				
	x					
			x		x	x
x		x			x	
x						
		x	x		x	x
			c			
			c			
			c			
x						
		x				
	x	x				
	c					
	c					
				x	x	

15

Environmental Art and Social Practice (p. **Error! Bookmark not defined.**)

3

Environmental Sciences (p. **Error! Bookmark not defined.**)

Environmental Studies (p. **Error! Bookmark not defined.**)

Conservation Science and Policy

Geographic Information Systems

Global Environmental Justice

Environmental Studies / Biology Combined B.A. (p. **Error! Bookmark not defined.**)

Environmental Studies / Earth Sciences Combined B.A. (p. **Error! Bookmark not defined.**)

Environmental Studies / Economics Combined B.A. (p. **Error! Bookmark not defined.**)

Feminist Studies (p. **Error! Bookmark not defined.**)

Film and Digital Media (p. **Error! Bookmark not defined.**)

Critical Studies

Integrated Critical Practice

Games and Playable Media (p. **Error! Bookmark not defined.**)

Undergraduate Education			Graduate Education			
			x			
	x					
x					x	x
c						
c						
c						
x						
x						
x						
x					x	x
x		x			x	x
c						
c						
				x		

Global Economics (p. **Error! Bookmark not defined.**)

Global Information and Social Enterprise Studies (p. **Error! Bookmark not defined.**)

History (p. **Error! Bookmark not defined.**)

1

The Americas and Africa

Asia and the Pacific

Europe and the Mediterranean World

History of Art and Visual Culture (p. **Error! Bookmark not defined.**)

Curation, Heritage, and Museums

History of Consciousness (p. **Error! Bookmark not defined.**)

Human Computer Interaction (p. **Error! Bookmark not defined.**)

Human Language Media and Modeling (p. **Error! Bookmark not defined.**)

Human Biology (p. **Error! Bookmark not defined.**)

Italian Studies (p. **Error! Bookmark not defined.**)

Jewish Studies (p. **Error! Bookmark not defined.**)

Languages Studies (p. **Error! Bookmark not defined.**)

Chinese

French

German

Undergraduate Education			Graduate Education			
x						
		x				
x		x	x		x	
c						
c						
c						
x		x				
c						
					x	x
				x		
						x
	x					
		x				
x		x				
x		x				
c		c				
c		c				
c		c				

	Undergraduate Education		Graduate Education			
Italian	c	c				
Japanese	c	c				
Spanish	c	c				
Latin American and Latino Studies (p. Error! Bookmark not defined.)	x	x			x	x
Latin American and Latino Studies / Politics Combined (p. Error! Bookmark not defined.)	x					
Latin American and Latino Studies / Sociology Combined (p. Error! Bookmark not defined.)	x					
Legal Studies (p. Error! Bookmark not defined.)	x	x				
Linguistics (p. Error! Bookmark not defined.) 5	x	x	x		x	
Literature (p. Error! Bookmark not defined.) 1	x	x	x		x	x
Creative/Critical Writing					c	
Creative Writing	c					
French Literature	c					
General Literature	c					
German Literature	c					
Greek and Latin literatures	c					
Italian Literature	c					
Spanish/Latin American/Latino literatures	c					
Marine Biology (p. Error! Bookmark not defined.)		x				

Mathematics (p. **Error! Bookmark not defined.**)

13

Computational Mathematics

Pure Mathematics

Mathematics Education (p. **Error! Bookmark not defined.**)

Microbiology and Environmental Toxicology (p. **Error! Bookmark not defined.**)

7

Molecular, Cell, and Developmental Biology (p. **Error! Bookmark not defined.**)

Music (p. **Error! Bookmark not defined.**)

8

Contemporary Practices

Global Musics

Western Art Music

Music: Electronic Music (p. **Error! Bookmark not defined.**)

Music: Jazz, Spontaneous Composition, and Improvisation (p. **Error! Bookmark not defined.**)

Music: Western Art Music (p. **Error! Bookmark not defined.**)

Natural Language Processing (p. **Error! Bookmark not defined.**)

Network and Digital Technology (p. **Error! Bookmark not defined.**)

Neuroscience (p. **Error! Bookmark not defined.**)

Undergraduate Education			Graduate Education			
x	x	x	x		x	
c						
c			c		c	
x						
				x	x	x
	x			x	x	
x			x		x	
c						
c						
c						
		x				
		x				
		x				
				x		
x						
	x					

	Undergraduate Education		Graduate Education			
Ocean Sciences (p. Error! Bookmark not defined.)				x	x	
Biological Oceanography					c	
Chemical Oceanography					c	
Geological Oceanography					c	
Physical Oceanography					c	
Philosophy (p. Error! Bookmark not defined.) 9	x	x	x		x	x
Physics (p. Error! Bookmark not defined.) 10		x	x		x	x
Physics (Astrophysics) (p. Error! Bookmark not defined.)		x				
Plant Sciences (p. Error! Bookmark not defined.)		x				
Politics (p. Error! Bookmark not defined.)	x		x		x	x
Psychology (p. Error! Bookmark not defined.) 1	x				x	
Cognitive Psychology					c	
Developmental Psychology					c	
Social Psychology					c	
Robotics Engineering (p. Error! Bookmark not defined.)		x				
Robotics and Control (p. Error! Bookmark not defined.)						x
Science Communication (p. Error! Bookmark not defined.)				x		
Scientific Computing (p. Error! Bookmark not defined.)						x

	Undergraduate Education		Graduate Education			
Scientific Computing and Applied Mathematics (p. Error! Bookmark not defined.) 11				x		
Science Education (p. Error! Bookmark not defined.)	x					
Serious Games (p. Error! Bookmark not defined.)				x		
Social Documentation (p. Error! Bookmark not defined.) 3			x			x
Sociology (p. Error! Bookmark not defined.) 1	x				x	x
Spanish Studies (p. Error! Bookmark not defined.)	x		x			
Languages and Linguistics	c					
Literature and Culture	c					
Statistical Science (p. Error! Bookmark not defined.) 14				x	x	
Statistics (p. Error! Bookmark not defined.)			x			x
Sustainability Studies (p. Error! Bookmark not defined.)			x			
Technology and Information Management (p. Error! Bookmark not defined.)		x	x			
Theater Arts (p. Error! Bookmark not defined.)	x		x	x		
Dance	c		x			
Design and Technology	c					
Drama	c					
Visual Studies (p. Error! Bookmark not defined.)					x	x
Writing (p. Error! Bookmark not defined.)						

Undergraduate Education			Graduate Education			

Combined majors. In addition, students may complete a combined major leading to a B.A. degree in a number of designated fields. Combined majors currently available include those in Earth sciences/anthropology, economics/mathematics, environmental studies/biology, environmental studies/Earth sciences, environmental studies/economics, Latin American and Latino studies/politics, and Latin American and Latino studies/sociology. Students also have the option of pursuing a double major.

c = concentration, or emphasis, within a program. Some programs give students the option of following a general course of study or selecting a concentration; other programs require students to choose a concentration. Consult the linked program.

¹ An intensive major is also available.

² A five-year contiguous bachelor's/master's pathway is available coordinating the existing bachelor's degree and master's degree in computer science and engineering.

³ A Master of Fine Arts (M.F.A.) degree is awarded in digital arts and new media, social documentation, and environmental art and social practice.

⁴ The state of California does not allow academic majors in education that lead to a teaching credential. Instead, we offer an undergraduate major in education, democracy and justice and two minors in education for students who are considering a career in teaching or who hold a more general interest in educational studies. Please note that the major and minors in education do not provide a California Teaching Credential. Additionally, please note that the UC Santa Cruz teaching credential program is a graduate program and coursework taken in the major or minor cannot be substituted for credential requirements, except in specifically designated pathways.

UCSC offers the professional clear Cross-cultural, Language, and Academic Development (CLAD) and Bilingual Cross-Cultural, Language and Academic Development (BCLAD) multiple subjects credentials, which are used in self-contained elementary classrooms (K-6) where all subjects are taught by the same teacher. UCSC also offers the CLAD and BCLAD single subjects credentials, which are used in departmentalized settings where the teacher is responsible for one subject (7-12).

⁵ A five-year contiguous bachelor's/master's pathway is available coordinating the existing bachelor's degree and master's degree in linguistics.

⁶ A five-year contiguous bachelor's/master's pathway is available coordinating the existing bachelor's degree in critical race and ethnic studies and the MA/Credential Master's in education..

⁷ A five-year contiguous bachelor's/master's pathway is available coordinating an existing bachelor's degree from within the chemistry or biology programs (majors administered by the departments of MCD Biology, EE Biology, Chemistry and Biochemistry, and Biomolecular engineering) and the M.S. in microbiology and environmental toxicology.

⁸ A Bachelor of Music (B.M.) degree in music also available. A Doctor of Musical Arts (D.M.A.) degree in composition is also available.

⁹ A five year contiguous bachelor's/master's pathway is available coordinating the exiting bachelor's and master's degree in philosophy.

¹⁰ A five-year contiguous bachelor's/master's pathway is available coordinating the existing bachelor's degree and master's degree in physics. Students in the B.S./M.S. path can pursue concentrations in material and device physics, energy and the environment, computational physics, and medical biophysics.

¹¹ A five-year contiguous bachelor's/master's pathway is available coordinating existing bachelor's degrees in applied mathematics, mathematics, computer science, robotics engineering, physics, applied physics, physics (astrophysics), and the M.S. in scientific computing and applied mathematics.

¹² A five-year contiguous bachelor's/master's pathway is available coordinating the biomolecular engineering and bioinformatics bachelor's degree (bioinformatics concentration) with the master's degree.

- ¹³ A five-year contiguous bachelor's/master's pathway is available coordinating the existing bachelor's and master's degree in mathematics.
- ¹⁴ A five-year contiguous bachelor's/master's pathway is available coordinating existing bachelor's degrees and the M.S. in Statistical Science.
- ¹⁵ A five-year contiguous bachelor's/master's pathway is available coordinating the existing bachelor's degrees and M.S. in Electrical and Computer Engineering.
- ¹⁶ A five-year contiguous bachelor's/master's pathway is available coordinating the existing bachelor's degree in science education and the M.A/Credential Master's in Education.
- ¹⁷ A five-year contiguous bachelor's/master's pathway is available coordinating the existing bachelor's degrees and the ecology and evolutionary biology M.A.
- ¹⁸ A five-year contiguous bachelor's/master's pathway is available coordinating existing bachelor's degree in Earth sciences or environmental sciences and the M.S. degree in Earth sciences.

Degrees

B.A. = Bachelor of Arts
B.M. = Bachelor of Music
B.S. = Bachelor of Science
D.M.A. = Doctor of Musical Arts
Ed.D = Doctor of Education
M.A. = Master of Arts
M.F.A. = Master of Fine Arts
M.S. = Master of Science
Ph.D. = Doctor of Philosophy

ACADEMIC UNITS

ARTS DIVISION

Porter College, D Building,
(831) 459-4940
<http://arts.ucsc.edu>

The Arts Division offers both creative and critical studies of art and culture at the undergraduate and graduate level. The division is committed to building our students' capacity for creative and critical thinking. Instruction in the arts inspires and develops the skills needed for individual and collaborative creative thought, analysis, and action within and beyond the university. Our faculty consists of artists, performers, historians, critics, makers, and theorists working across the arts in a global context, and addressing some of the most pressing issues of our day.

Undergraduate education in the arts includes bachelor of arts (B.A.) programs in art, art and design: games and playable media, film and digital media, history of art and visual culture, music, and theater arts, and a bachelor of music (B.M.). There are also concentrations offered in film and digital media (critical studies; production; and integrated critical practice), history of art and visual culture (curation, heritage, and museums), and music (western art music; and global musics). Minors are offered in film and digital media, history of art and visual culture, electronic music, jazz music, theater arts, and dance.

Established graduate programs include the interdisciplinary digital arts and new media master of fine arts (M.F.A.) program, the social documentation master of fine arts (M.F.A.), the music master of arts (M.A.), and the theater arts master of arts (M.A.), as well as the recently launched environmental art and social practice master of fine arts (M.F.A.). Doctoral programs include the music composition doctor of musical arts (D.M.A.), and Ph.D. programs in music, visual studies, and film and digital media.

The Arts Division provides students with access to quality research, work and maker spaces, including a digital-arts research facility with two experimental media labs, along with a state-of-the-art music recital hall, practice rooms, electronic music studios, and recording facilities, four theaters for dramatic productions, filmmaking studios and editing suites, surround-sound screening theaters, drama and dance studios, painting and printmaking studios, a foundry (unique to the U.C. system), photography and computer laboratories, and specialized lecture and seminar classrooms. McHenry Library houses an extensive collection of books and periodicals on the arts, as well as an analog and digital slide collection, music scores and recordings, and one of the largest collections of films and DVDs in the University of California system. Exhibition space in the arts includes galleries for students, faculty, and visiting artists to show their work. The Mary Porter Sesnon Art Gallery presents curated exhibitions to the university community and the general public. The Institute of the Arts and Sciences, a focus for interdisciplinary creative work,

exhibitions, conferences, symposia, and seminars offers a robust schedule of programming.

Other Division Highlights: The Theater Arts Department offers a wide variety of performances in four venues, ranging from faculty-directed productions of classics and musicals on our Mainstage to intimate student-created productions in our century-old converted barn. Student work is regularly broadcast on SCTV, and *Eyecandy*, a student-run magazine and blog, publishes student critique on film, television, and digital media. The Music Department hosts an annual festival of contemporary music, *April in Santa Cruz*, and an opera in the spring quarter of each year, and presents a variety of solo and ensemble concert programs throughout the year. The History of Art and Visual Culture Department hosts a series of speakers and seminars each year on rotating topics that are supported by the Patricia and Rowland Rebele Endowed Chair and sponsors the student-run journal *Refract*. The Art Department sponsors regularly scheduled public presentations as well as quarterly open studios and a print and photo sale in the spring. The Digital Arts and New Media M.F.A. program regularly sponsors digital arts events, such as festivals, symposia, visiting speakers, and exhibitions of student work, both on- and off-campus, culminating in an annual exhibition of graduate thesis research each spring. The Arts Division supports the dissemination of student work through the Arts Dean's Fund for Excellence and provides professional internship opportunities through Arts Professional Pathways and departmental internship programs.

For more information about specific programs in the arts, please visit catalog listings and web sites for: Art; Digital Arts and New Media; Art + Design: Games + Playable Media; Film and Digital Media; History of Art and Visual Culture; Music; and Theater Arts.

Arts - Info

Porter College, D Building,
(831) 459-4940
<http://arts.ucsc.edu>

The Arts Division offers both creative and critical studies of art and culture at the undergraduate and graduate level. The division is committed to building our students' capacity for creative and critical thinking. Instruction in the arts inspires and develops the skills needed for individual and collaborative creative thought, analysis, and action within and beyond the university. Our faculty consists of artists, performers, historians, critics, makers, and theorists working across the arts in a global context, and addressing some of the most pressing issues of our day.

Undergraduate education in the arts includes bachelor of arts (B.A.) programs in art, art and design: games and playable media, film and digital media, history of art and visual culture, music, and theater arts, and a bachelor of music (B.M.). There are also concentrations offered in film and digital media (critical studies; production; and integrated critical practice), history of art and visual culture (curation, heritage, and

museums), and music (western art music; and global musics). Minors are offered in film and digital media, history of art and visual culture, electronic music, jazz music, theater arts, and dance.

Established graduate programs include the interdisciplinary digital arts and new media master of fine arts (M.F.A.) program, the social documentation master of fine arts (M.F.A.), the music master of arts (M.A.), and the theater arts master of arts (M.A.), as well as the recently launched environmental art and social practice master of fine arts (M.F.A.). Doctoral programs include the music composition doctor of musical arts (D.M.A.), and Ph.D. programs in music, visual studies, and film and digital media.

The Arts Division provides students with access to quality research, work and maker spaces, including a digital-arts research facility with two experimental media labs, along with a state-of-the-art music recital hall, practice rooms, electronic music studios, and recording facilities, four theaters for dramatic productions, filmmaking studios and editing suites, surround-sound screening theaters, drama and dance studios, painting and printmaking studios, a foundry (unique to the U.C. system), photography and computer laboratories, and specialized lecture and seminar classrooms. McHenry Library houses an extensive collection of books and periodicals on the arts, as well as an analog and digital slide collection, music scores and recordings, and one of the largest collections of films and DVDs in the University of California system. Exhibition space in the arts includes galleries for students, faculty, and visiting artists to show their work. The Mary Porter Sesnon Art Gallery presents curated exhibitions to the university community and the general public. The Institute of the Arts and Sciences, a focus for interdisciplinary creative work, exhibitions, conferences, symposia, and seminars offers a robust schedule of programming.

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Art

Elena Baskin Visual Arts Studios
Room E-104
(831) 459-2272
visart@ucsc.edu
<http://art.ucsc.edu>

PROGRAMS OFFERED

Art B.A. (p. 21)

Environmental Art and Social Practice M.F.A. (p. 24)

UNDERGRADUATE PROGRAM

The Art Department offers an integrated program of study in theory and practice exploring the power of visual communication for personal expression and public interaction. The department provides students with the means to pursue this exploration through courses that provide the practical hands-on learning skills for art production in a variety of media within the contexts of critical thinking and broad-based social perspectives.

The art program at UC Santa Cruz is composed of courses in drawing, animation, painting, photography, sculpture, print media, intermedia, critical theory, electronic art, public art, environmental art, social art practice, and interactive technologies. Baskin visual arts studios provide world-class facilities for art production in these areas. The Art Department is committed to pursuing a continuing dialogue about what constitutes basic preparation in the arts while offering students experience in established practices, new genres, and new technologies.

Students graduating with a major in art may become professional artists or pursue careers in such diverse areas as arts administration, arts management, museum education, art direction, communication design, web design, digital imaging, curating, art education, multi-media specialist, industry consultant, model maker, and publishing. Many students who want to teach at the college level continue their education in graduate school.

GRADUATE PROGRAM

The Environmental Arts and Social Practice M.F.A. integrates ecological thinking with social justice principles in a two-year degree program focusing on creative artistic inquiry and project-based research. Designed for students who seek to develop their artwork in relation to social and environmental justice questions, contexts, and communities, our place-based

program emphasizes making and locating art in the world, with human and non-human collaborators, and grounded in individual and collective commitments, inventions, and aesthetic visions.

The program invites students to experiment with a breadth of approaches, art mediums, research methods, theoretical frameworks and technologies ranging from the traditional to the most contemporary, with the understanding that all media can be relevant in developing new approaches and responses to environmental and social issues. The program's interdisciplinary emphasis also encourages students to engage with other departments, divisions, centers, labs, and faculty across the university to deepen and enrich their research, and to partner with groups and organizations outside the university in the development and realization of their projects.

Students gain practical experience through direct engagement with places and communities and hone their skills of critical analysis, while studying methods, histories and theories of the field, and developing their own creative directions through their thesis projects. Students build career paths connecting multimedia art practices with environmental justice, social justice, public policy, public art, curatorial practices, art education, art writing, urban planning, landscape architecture, and other professional and creative practices.

COURSES FOR NON-MAJORS

The Art Department offers courses for non-art majors that fulfill general education requirements and offer students a chance to explore art to see if it interests them as a major.

These courses include ART 10D, 2D Foundation; ART 10E, 3D Foundation; ART 10F, 4D Foundation; ART 80D, Fundamentals of Photography; ART 80E, Environmental Art in the Expanded Field (online course); ART 80F, Introduction to Issues in Digital Media; ART 80T, Digital Tools for Contemporary Artists; ART 20L, Introduction to Drawing (online course); and ART 106O, 2D Animation (online course).

ART B.A.

Information and Policies

Introduction

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Academic Advising for the Program

For more information and advising on the art major, please contact the undergraduate advisor at artadvisor@ucsc.edu. For junior transfer students, please also see more detailed information below under Transfer Information and Policy.

Getting Started in the Major

Acceptance to the Art Major

Students should contact the undergraduate art advisor if they are interested in pursuing an art major and should meet with the advisor in their first quarter at UC Santa Cruz if they intend to enroll in art courses their frosh year. A portfolio is not required for entering frosh. Students are recommended to pass two foundation courses in their first year in order to meet the campus deadline to declare the major. However, all three foundation courses (ART 10D, ART 10E, ART 10F) are requirements for the major. Delaying taking these classes until the sophomore year may delay a student's graduation.

Getting into Studio Classes

Studio art classes are very small (average 25 students) compared to courses from other departments on campus that can accommodate large numbers of students. Frosh may not take any lower division studios until they complete all three of the Art 10 series foundation courses.

General Education Requirements

If you are not able to get into a foundation or studio course in a particular quarter at UC Santa Cruz, you can enroll in courses that fulfill the general education (GE) requirements. You should balance major requirements and GE requirements throughout your career at UCSC and not focus completely on your GEs in your frosh or sophomore years, as this could delay your graduation.

Program Learning Outcomes

Students who earn a Bachelor of Arts (B.A.) in Art will gain the skills, knowledge, and understanding that will enable them to:

- demonstrate proficiency in a range of techniques and media;
- demonstrate the ability to imagine, create, and resolve a work of art;

- demonstrate familiarity with and ability to analyze, both verbally and in writing, issues and forms of contemporary art with a clear understanding of historical precedents; and
- demonstrate critical thinking through the ability to articulate an insightful response and analysis of a work of art in order to participate in discussions and studio critiques.

Major Qualification Policy and Declaration Process

Major Qualification

Students entering UC Santa Cruz as frosh may apply for admission to the art major after completing two of the following:

ART 10D	2D Foundation	5
ART 10E	3D Foundation	5
ART 10F	4D Foundation	5

Portfolio

A portfolio is not required for entering frosh students. Students should contact the undergraduate art advisor if they are interested in pursuing an art major and intend to enroll in foundation courses (ART 10 series) their freshman year. Acceptance into the art major is contingent on passing two of the three foundation courses that we offer. All three foundation classes are prerequisites to lower-division studios. Consequently, it is essential that students interested in pursuing the art major take the three foundation courses in their freshman year.

Transfer students should consult the Transfer and Information Policy section.

Appeal Process

Students who are informed that they are not eligible to declare the major may appeal this decision by submitting a letter to the department chair within 15 days from the date the notification was mailed. Within 15 days of receipt of the appeal, the department will notify the student and college of the decision. Appeals should be send via email to artadvisor@ucsc.edu.

How to Declare a Major

Students who complete the major qualification requirements may declare the major by meeting with the academic advisor (artadvisor@ucsc.edu) and filling out the declaration form.

Students should submit a petition to declare as soon as they complete the major qualification requirements or reach their declaration deadline quarter (whichever comes first).

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed major qualification courses.

Transfer Information and Policy

Transfer Admission Screening Policy

Prospective transfer students should complete three courses articulated to courses in the Art 20 series in three different media.

Students applying for fall entry must pass a portfolio review in early April and be admitted to UC Santa Cruz to declare the art major. Admission to UC Santa Cruz does not guarantee eligibility to declare the major, nor does passing the portfolio review guarantee admission to the campus. Transfer students must identify themselves as proposed art majors when applying to the university in order to receive information on the portfolio review deadlines and the materials required for the review. If a student is admitted to UC Santa Cruz and does not pass the portfolio review, the student will need to pursue an alternate major. Students will be notified of the results of the portfolio review before they need to submit their Statement of Intent to Register for UC Santa Cruz.

For timely graduation, transfer students should also complete two history of art and visual culture courses prior to transfer, including one in Western art and culture and one in non-Western art and culture.

Prospective students are encouraged to prioritize required and recommended major preparation, and may additionally complete courses that articulate to UC Santa Cruz general education requirements as time allows.

Getting Started at UCSC as a Transfer Student

Once a student is accepted to the university, has passed the portfolio review and has submitted their Statement of Intent to Register, the undergraduate advisor will be in contact with the student to declare their major and set up a program of study.

Letter Grade Policy

This program does not have a letter grade policy.

Three-Year Pathway

The Art Department has a three-year pathway designed for students who want to complete their Art B.A. in three years. It is an intensive program that includes all of the courses for the current art B.A. major, as well as all of the general education requirements and electives for the university. Students should begin this pathway in their frosh year to be able to complete the required courses in three years. Summer Session attendance is required for all three years. For more information, contact the undergraduate advisor.

Course Substitution Policy

Double Majors and Major/Minor Combinations Policy

Study Abroad

The UC Education Abroad Program (EAP) offers students the opportunity for study abroad. Art majors may participate in EAP in their junior year. When considering attending EAP, the student should be mindful that only three courses may be

substituted in the art major and each must receive a grade of C or better.

Honors

Honors in the art major are awarded to graduating seniors whose academic performance demonstrates excellence at a grade point average of 3.95 or above in their upper-division art studio courses and ART 190A. Highest honors in the art major are awarded to graduating seniors whose academic performance demonstrates excellence at a grade point average of 4.0 in their upper-division art studios and ART 190A.

[Optional Catchall]

Materials Fee

Art students should be aware of the materials fee required for some studio courses. The fee is billed to the student's account for specific course materials purchased by the Art Department through the university. Fees generally range from \$15 to \$175 per course. Students may incur additional expense purchasing individual supplies.

Requirements and Planners

Course Requirements

The minimum requirements for art majors who were admitted to UC Santa Cruz in their frosh year are completion of nine lower-division and eight upper-division courses (consisting of seven upper-division studio courses and ART 190A) and satisfaction of the senior comprehensive requirement. Junior transfer students complete seven lower-division and eight upper-division courses and their senior comprehensive requirement. The comprehensive requirement may be fulfilled by ART 190B, Senior Project, as part of the required seven upper-division studios. The comprehensive requirement may also be fulfilled by a review of the students artwork by a ladder rank faculty. If the latter choice is selected, the student must then complete seven upper-division studios. A maximum of three courses total from outside the Art Department (including UC Education Abroad Program [EAP] courses) may be substituted for regular art courses with the approval of a major advisor. In courses taken outside the UC Santa Cruz Art Department, students must have received a grade of C or higher.

Students plan their course of study in consultation with a faculty advisor.

Lower-Division Courses

Students complete nine courses as follows:

The Foundation

All of the following (two of the ART 10 series are waived for junior transfers):

ART 10D	2D Foundation	5
ART 10E	3D Foundation	5
ART 10F	4D Foundation	5

Introduction to Contemporary Art Practice

Three of the following (junior transfers should complete them at community college):

ART 20G	Introduction to Print Media and Drawing	5
ART 20H	Introduction to Sculpture and Public Art	5
ART 20I	Introduction to Photography	5
ART 20J	Introduction to Drawing and Painting	5
ART 20K	Introduction to New Media and Digital Artmaking	5
ART 20L	Introduction to Drawing	5

Digital Tools

Students must take:

ART 80T	Digital Tools for Contemporary Art Practice	5
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Critical Theory and Historical Context

Students complete two courses from History of Art and Visual Culture (HAVC), one in Western Art and Culture and one in non-Western Art and Culture. Students take one course from each of the sections below:

Western Art and Culture: HAVC 30-HAVC 46, HAVC 48, HAVC 85, HAVC 133A-HAVC 143B, HAVC 143D-HAVC 143G, HAVC 157B-HAVC 157D, HAVC 186, HAVC 190O-HAVC 190S, HAVC 191B-HAVC 191N, HAVC 191P-HAVC 191S.

Non-Western Art and Culture: HAVC 10-HAVC 27, HAVC 50-HAVC 80, HAVC 110-HAVC 127F, HAVC 143C, HAVC 151-HAVC 155, HAVC 160A-HAVC 179, HAVC 190A-HAVC 190N, HAVC 190T-HAVC 191A, HAVC 191O.

Note: Students may use Advanced Placement (AP) in Art History in lieu of the Western-emphasis HAVC requirement.

Students may contact the undergraduate advisor for updates to these lists.

Upper-Division Courses

Students complete eight courses as follows:

Studio Work

Students take seven upper-division studio courses. These include courses numbered ART 101—ART 189, ART 190B, ART 194, ART 196, ART 198, and ART 199. ART 190B satisfies both an upper-division studio as well as the comprehensive requirement.

Transfer students are strongly encouraged to take ART 194 during their junior year.

Electives

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement in art is satisfied by completing:

ART 190A Writing for Artists 5

Comprehensive Requirement

All art majors satisfy the capstone/comprehensive requirement with the following:

ART 190A Writing for Artists 5

Plus one of the following options:

- Presenting an exhibition and, by appointment, meeting with a faculty member for review and critique of the exhibition; or
- Submitting a portfolio and, by appointment, meeting with a faculty member for review and critique of the portfolio; or
- Completing the following course:

ART 190B Senior Project 5

Planners

Art Major Planner (Incoming Frosh)

The following is a recommended academic plan for students to complete:

Year	Fall	Winter	Spring
1st (frosh)	ART 10E	ART 10D	ART 10F
2nd (soph)	ART 20 series HAVC*	ART 20 series ART 80T	ART 20 series HAVC*
3rd (junior)	UD studio	ART 190A UD studio	UD Studio
4th (senior)	UD studio UD studio	UD studio	UD studio or ART 190B

*Courses from history of art and visual culture (HAVC) (one with a Western emphasis, one with a non-Western emphasis). See Course Requirements section.

In addition to the specific courses shown in these planners, a student must complete courses satisfying the CC, ER, MF, SI, SR, TA, and C General Education requirements.

Art Major Planner (Junior Transfers)

The following is a recommended academic plan for junior transfers who have completed three lower-division studios across three different media and partial IGETC:

Year	Fall	Winter	Spring
1st (junior)	UD studio ART 10 Series†	ART 190A ART 80T	UD studio HAVC*
2nd (senior)	UD studio HAVC*	UD studio UD studio	UD studio UD studio or ART 190B

† Art 10 series: Only one of the three ART 10 series courses is required for junior transfers. Other Art 10 series courses are offered in winter and spring.

*Courses from history of art and visual culture (one with a Western emphasis, one with a non-Western emphasis). It is highly recommended that junior transfers take history of art and visual culture courses at the community college. Western emphasis courses are listed as "Europe and the Americas," all others are non-Western on assist.org.

ENVIRONMENTAL ART AND SOCIAL PRACTICE M.F.A.

Introduction

The Master of Fine Arts in Environmental Art and Social Practice is a unique graduate program that trains students to critically analyze, understand, and respond to the challenges of our contemporary era through creative artistic inquiry and project-based research. The two-year program is designed for the student who seeks a career in the field of environmental art and social practice artmaking as these forms relate to environmental justice, social justice, public policy, and multimedia art practices, criticism, and theory. One of the first of its kind in the country integrating this dual focus, the program builds on the unique intellectual reputation of UC Santa Cruz as a leader in promoting social justice, ecological thinking, and inventive explorations of the nature/culture interface, and contributes to this ongoing legacy through the world-transforming potential of creative practice.

The field of environmental and social practice artmaking continues to develop rapidly in relation to the urgency of social and environmental pressures, requiring artists to learn new tools and strategies for effective engagement in society at large,

along with important aspects of traditional artistic training. Within this frame, the program invites students to utilize a breadth of approaches, art mediums, research methods, theoretical frameworks, and technologies ranging from the traditional to the most contemporary, with the understanding that all media can be relevant in developing new approaches and responses to environmental and social issues. The program's interdisciplinary emphasis also encourages students to engage with other departments, divisions, centers, and faculty across the university to deepen and enrich their research, and to partner with groups and organizations outside the university in the development and execution of their projects.

Graduates of the program find employment in the art world and in academia as well as qualifying for job opportunities in hybrid and developing fields, including in green technology, environmental policy, public arts policy, community planning, public space design, and other forms of advising and design where creative approaches to problem-solving is called for. Depending on the focus of their thesis project, graduates' access to academic positions is not limited to art practice fields, but may include political theory, humanities, and social issue curricula, as well as hybrid and cross-disciplinary art programs linked with science, social science, and the humanities. Graduates may also work as arts administrators in a variety of institutions or seek employment in curatorial positions, journalism, research, and editorial positions, as well as in audio-visual production and in the digital economy. Some graduates may also work as self-employed artists or in unique positions that defy existing job categories and are specifically tailored to their skills and interests.

Objectives

The M.F.A. in Environmental Art and Social Practice program supports the development of a student's artistic practice in relation to issues and contexts relevant to these two related areas of study. The program aims to train students in practical skills as they relate to project-based arts research in the areas of: creative methodologies, critical analysis, historical perspectives, ethical standards, collaborative strategies, reflective critique, and art pedagogies.

Students learn to conceive and execute projects, articulate narratives to support their ideas, and establish working relationships with other practitioners in the field. They develop methods, perspectives, and concepts to support lifelong artistic inquiry and thriving careers, and to contribute to, and further develop, the emergent fields of environmental art and social practice.

Requirements

In the first year, students work collaboratively on practice-based research topics while studying methodologies, histories, theories and pedagogies relevant to the field. They also take electives relevant to their research interests chosen from course offerings throughout the university. In the spring of their first year they also take a 2-credit thesis course in which they develop a working bibliography and thesis outline.

In the second year, students develop and realize their thesis projects. They identify a focus and geographic location, find

partners and design a project individually, or in collaboration. Each student's creative research is supported by a series of core critique classes as well as electives chosen by the student to deepen their knowledge and fine-tune their research direction, and by 2 credits of thesis advising every quarter. In the spring of the second year they also take a 2-credit curatorial class focusing on the public presentation of their MFA research.

Course Requirements

A minimum of 72 credits are required for the Environmental Art and Social Practice MFA degree. Fifty-two credits are required core courses and 20 credits are electives.

First Year

Students take the following core courses in their first year. ART 230 can be taken in the first or second year.

ART 210A	Practice-Based Research I	5
ART 210B	Practice-Based Research II	5
ART 210C	Practice-Based Research III	5
ART 220	Methods in Environmental Art and Social Practice	5
ART 230	Histories and Theories in Environmental Art and Social Practice	5
ART 240	Art Pedagogies	2
ART 250	Writing Matters	2

Second Year

Students take the following courses in their second year. If students did not take ART 230 in their first year, they should take it in their second year.

ART 260	Curatorial Collective	2
ART 299F	Thesis Research	2
ART 270A	Project Development and Critique I	7
ART 270B	Project Development and Critique II	7
ART 280	MFA Project Production	5

ART 299F is taken each quarter of the second year for a total of 6 credits.

Electives

Students take 20 credits of electives selected from the list of approved electives (p. 26). Additional courses at the university may fit into a student's research interests and be suitable as an elective. Students should consult their faculty advisor or director of graduate studies in the program if this is the case. Elective courses can come from other academic programs and departments at UC Santa Cruz or the Art Department, and are available throughout the academic year. Students may take up to 15 credits of upper-division art studio courses in addition to the courses specifically listed in the above link. Up to two 5-credit independent study courses may also contribute to fulfilling this requirement.

Other Requirements

First-Year Review

At the end of the spring quarter of their first year, students will undergo a first-year review by Art Department faculty in order to advance in the program. The review committee will be selected by the student and approved by the graduate program director and the dean of the Graduate Division. The review committee is comprised of the student's faculty advisor, another Art Department Senate faculty member and a third faculty member who may either be in art, in another department at the university, or someone from outside the university whose expertise is relevant to the student's project and who can commit to following the student's progress through their thesis review in the spring of their second year. (The external committee members are selected based on their research interests and close work with the student). The same committee will later become the student's Advancement to Candidacy and M.F.A. Thesis Review Committee.

The First-Year Review consists of a review and critique of creative research, along with confirmation that all first-year core courses and electives have been completed with satisfactory grades and in good academic standing. For the review, students submit a five-page paper outlining their creative research, and they perform an oral examination where they present their preliminary proposal for the project they will pursue for their second year. The committee will assess the student's progress in terms of creative research, comprehension of methods, theories, and practices in environmental art and social practice, and commitment to the program.

Advancement to Candidacy and Capstone/Thesis

Advancement to candidacy happens in the fall quarter of the second year. At this time, students will present to their committee a final project proposal, revised and developed following the first year review, that will serve to direct their thesis research. Proposals will outline the focus of the project, conceptual and theoretical grounding, materials, location, partners and/or collaborators, preliminary annotated bibliography/list of related artworks, and a step-by-step plan for carrying out the project. Proposals will be evaluated based on clarity and quality of purpose, concept and plan, feasibility within the time-frame and budget proposed, evidence of established relationships with partners/collaborators, and potential to make a significant creative contribution to the field. The thesis committee must approve the thesis proposal/project outline no later than the end of the first quarter of the second year.

For the M.F.A. thesis capstone, each student is required to host a public exhibition and/or other public presentation of their creative work and submit a thesis paper that adequately defends their thesis, research, and findings, which will be no less than 25 pages. Students will also be required to pass an oral examination. The final exhibition may take place in the context of the group M.F.A. thesis exhibition or at a site off campus with an accompanying component in the group M.F.A. thesis exhibition. The M.F.A. thesis review committee will review each final thesis project in the spring quarter of the second year or after a student has completed a minimum of 72 credits.

While form and media will vary greatly, completed thesis projects will reflect original creative research and professional level production (individually or collaboratively authored), as well as command of the field.

Applying for Graduation

Students should contact the department advisor to confirm all requirements for the degree have been completed. Students must submit an Application for the M.F.A. to the department for review by the end of the second week of the quarter in which you intend to receive the certificate.

ENVIRONMENTAL ART AND SOCIAL PRACTICE M.F.A. ELECTIVES

Approved Electives for the Environmental Art and Social Practice M.F.A.

In addition to the list below, students may take up to 15 credits of upper-division ART studio courses. Not all courses in this list are offered each year. Some courses may require consent of the instructor or have prerequisites. Consult with the affiliated department for more information.

Electives

DANM 201	Recent Methods and Approaches to Digital Arts and Culture	5
DANM 202	Dialogues and Questions in Digital Arts and Culture	5
DANM 210	Project Design Studio	5
DANM 211	Critique	5
DANM 216	Digital Bodies	5
DANM 219	Introduction to Electronics for Artmaking	5
DANM 220	Introduction to Programming for the Arts	5
DANM 221	Mathematics and the Arts	5
DANM 227	Projected Light in Performance	5
DANM 233	The Object as Interface	5
DANM 241B	Modern Art: Cubism to Pop	5
DANM 250A	Collaborative Research Project Group: Art and Science	5
DANM 250B	Collaborative Research Project Group: Socially Engaged Art	5
DANM 250C	Collaborative Research Project Group: Performance and Embodiment	5
DANM 250E	Collaborative Research Project Group: Experimental Play	5
DANM 254I	Empirical Approaches to Art Information	5
DANM 281	Special Topics in Digital Arts and New Media	5
ENVS 104A	Introduction to Environmental Field Methods	5
ENVS 110	Institutions, the Environment, and Economic Systems	5
ENVS 142	Sustainable Energy	5

ENVS 147	Environmental Inequality/Environmental Justice	5	POLI 203	Making of the Modern	5
ENVS 156	Environmental Action Through Writing	5	POLI 207	Political Economies of Affect	5
ENVS 158	Political Ecology and Social Change	5	POLI 208	Race	5
ENVS 165	Sustainable Water Systems	5	POLI 222	Conflict and Change in American Politics and Policy	5
ENVS 169	Climate Change Ecology	5	POLI 232	United States Political History	5
ENVS 201A	Research Approaches in Environmental Studies	5	POLI 245	Latin American Politics	5
ENVS 210	Political Ecological Thought and Environment	5	POLI 247	Comparative Urban Politics	5
ENVS 215A	Geographic Information Systems and Environmental Applications	5	POLI 255	Comparative Anti-Colonialisms	5
ENVS 235	Social Theories of Nature	5	POLI 272	Critical Interventions in IR Theory and Global Political Economy	5
ENVS 271	Valuing the Environment	5	POLI 275	Contemporary Capitalism	5
FILM 136C	Visual Culture and Technology: History of New Media	5	PSYC 211A	Proseminar: Social Justice and the Individual	5
FILM 177	Digital Media Workshop: Computer as Medium	5	PSYC 211B	Social Justice, Society, and Policy	5
FILM 200A	Introduction to Graduate Study	5	PSYC 213	Special Topics in Social Psychology	5
FILM 200B	Theory and Praxis of Film and Digital Media 1	5	PSYC 246	Cultural Diversity in Human Development	5
FILM 200C	Theory and Praxis of Film and Digital Media 2	5	SOCD 202	Multiple-Platform Social Documentary Production	5
FILM 223	The Film/Video Essay	5	SOCD 204	Ethnographic Writing and Social Documentation	5
FILM 224	Mediating Difference	5	THEA 161S	American Drama: Politics and Theater	5
FILM 227	Representing Memory	5			
FILM 283	New Media Art and Digital Culture	5			
HAVC 201A	Introduction to Visual Studies and Critical Theory	5			
HAVC 202	Introduction to Visual Studies Methods	5			
HAVC 213	Theories and Visual Cultures of Iconoclasm	5			
HAVC 233	Topics in Contemporary Art and Visual Culture	5			
HAVC 236	Contemporary Art and Theories of Democracy	5			
HAVC 240	Seeing Race	5			
HAVC 241	Decolonizing Nature: Contemporary Art and Ecology	5			
LALS 200A	Power and Society	5			
LALS 200B	Cultures and Subjectivities in the Américas	5			
LALS 220	Transnational Civil Society: Limits and Possibilities	5			
LALS 225	Race in the Americas	5			
LALS 240	Culture and Politics of Human Rights	5			
LALS 242	Globalization, Transnationalism, and Gender in the Americas	5			
LALS 244	Digital Mapping and Human Geographies	5			
MUSC 105I	Improvisation and Collaborative Practices in the 20th Century	5			
MUSC 254C	Performativity and Music	5			
PHIL 152	Aesthetics	5			
PHIL 290H	Environmental Ethics	5			

Digital Arts and New Media

DARC 302
(831) 459-1919

<http://danm.ucsc.edu>

PROGRAMS OFFERED

Digital Arts and New Media M.F.A. (p. 28)

OTHER PROGRAMS OF INTEREST

Social Documentation M.F.A. (p. 42)

Film + Digital Media Ph.D. (p. 44)

Computational Media Ph.D. (p. 457)

Music D.M.A. (p. 79)

DIGITAL ARTS AND NEW MEDIA M.F.A.

Introduction

New technologies have profoundly changed contemporary culture and inevitably altered the role of the arts in society. The Digital Arts and New Media (DANM) Master of Fine Arts (M.F.A.) Program serves as a center for the development and study of digital media and the cultures that they have helped create. Faculty and students are drawn from a variety of backgrounds, such as the arts, computer engineering, humanities, the sciences, and social sciences, to pursue interdisciplinary artistic and scholarly research and production in the context of a broad examination of digital arts and cultures.

Curriculum

The DANM curriculum is designed to provide students with both the practical training and critical dialogue necessary to pursue their own individual goals as artists and cultural practitioners. The curriculum comprises core and research group-specific courses. Required core courses explore an array of recent methods and approaches in digital arts and culture. The research groups enable the student to pursue the construction of specific genealogies and theories with a sustained focus on a particular topic, by engaging in various dialogues at the intersection of theory and practice. While participating in the research group the students will also develop their thesis project and paper.

Research Groups

The DANM cohort is subdivided into research groups, each group of students focusing on a different research topic within the broader field of digital arts and new media. Each research group is led by a faculty member (or members) who serves as the faculty advisor to all students in their group. This faculty lead establishes a set of courses specific to their research topic, which are taken in addition to the core courses. Through these courses and faculty mentorship, students learn collaborative and practical research methodologies specific to their topic, have the opportunity to participate in professional-level academic research, and are provided a peer group pursuing similar research to their own. Coursework involves students working on faculty-initiated and -directed research projects, and creating their own related individual and collaborative projects. Research groups may also result in publications and exhibitions. The research experience and coursework in the research groups is intended to inform the student's thesis project. Students are admitted into a specific research group, and generally take the courses specific to their group in their first year.

Research groups may vary in topic every three years, depending on participating faculty. The DANM Principal Faculty will review the progress of current research groups every spring quarter in relation to the overall direction of the program and needed areas of expansion or shift. For fall 2020 and beyond,

admission there are the following research groups: Games and Playable Media, which explores radical approaches to interactive and playable media design; Future Stages which proposes a radical rethinking of live performance using critical and performative technologies, and the Isaac Julien lab which focuses on digital installation and multiple viewpoint technologies. The Isaac Julien lab also offers a concentration for students interested in media curating.

Applications

Prospective students in the Digital Arts and New Media program will have a foundation in the arts with some demonstrated interest in technology or a foundation in technology with demonstrated background in the arts. Many, but not all, entering students will have completed a Bachelor of Arts (B.A.) program in one or more of the arts disciplines (art or art history, film, multimedia, music, theater, video, etc.) or a Bachelor of Science (B.S.) program in computer science or computer or electrical engineering. Other successful applicants will have a B.A. or B.S. in another field but will be able to show substantial achievement in the arts, in technology, or in digital arts.

Prospective students are asked to identify their choice of research group in their application and statement of purpose. Admissions are tied to DANM research group foci. New students are admitted into a specific research group based on the quality and relevance of the student's prior work and expertise in their chosen area of focus.

In certain cases, students who demonstrate excellent potential for the program but lack proficiency in a "cross discipline" will be admitted to the program with the understanding that they will take courses during their first two quarters of study to make up that deficiency. An arts student lacking sufficient programming experience, for example, will be expected to take one or two programming courses in their first two quarters in addition to the DANM program requirements.

Students will apply online through the Division of Graduate Studies website between October and January for the following fall quarter. In addition to submitting an online application, students will be expected to submit an online portfolio. Further information can be found at the Division of Graduate Studies website.

Requirements

The DANM M.F.A. Program requires 72 credits of academic course work. In the first year, students generally take three courses each term. In the second year, students primarily take elective courses, work with their thesis committees, and pursue independent and directed research leading to the completion of the thesis project and paper.

Course Requirements

Core Courses

The core courses explore an array of recent methods and approaches in digital arts and culture. All students complete each of the following courses. DANM 280 (a 2-credit course) is

taken every quarter (six times); DANM 299 is taken twice, in any two quarters of the second year.

DANM 201	Recent Methods and Approaches to Digital Arts and Culture	5
DANM 202	Dialogues and Questions in Digital Arts and Culture	5
DANM 211	Critique	5
DANM 212	Thesis Proposal	5
DANM 215	MFA Exhibition Production	5
DANM 280	Seminar in Digital Arts and New Media	2
DANM 299	Thesis Research	5

Research Group Courses

The faculty lead of each research group establishes a set of courses specific to their research topic, which are taken in addition to the core courses. Students are admitted into a specific research group, and take the courses specific to their group in their first year. Each research group and its courses are described below. There is a curricular planner specific to each group in the Planners section.

Experimental Play

Over the last 40 years we have seen a blossoming of new models of play. From the rise of the New Games movement and the role-playing game genre (in the 1970s) to the current moment's rise of autobiographical, political, and independent art games on increasingly democratized platforms, to the emerging capabilities of augmented, virtual, and mixed reality platforms, we are changing who plays, how we play, and what play can mean. Each offering of the Experimental Play course will involve the creation of a different game prototype, producing a wide range of vibrant ideas from the research group's activity. A likely model is that one of these projects will be brought to completion as (part of) each student's thesis work.

Experimental Play has three required courses; take the following course three times:

DANM 250E	Collaborative Research Project Group: Experimental Play	5
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Future Stages

Future Stages investigates how we can stage "liveness" in a radically interconnected digital world and expand upon basic theatrical relationships in new and culturally relevant ways. Collaboration and integration of design, media, and storytelling are critical to this approach. Experimentation with new forms can reanimate the basic values of theater, foregrounding the essential nature of a live event and the creation of meaning in dialogue with an audience. By providing a laboratory environment with access to performance technologies, Future Stages will engage students in collaborative research and production that explore how media and narrative intersect in the cultural sphere.

Future Stages has six required courses; take all the courses below and THEA 294 is required to be taken twice. Students

produce their thesis productions in THEA 151 Studies in Performance in either winter or spring of their second year. THEA 151 replaces DANM 215 MFA Exhibition Production.

THEA 151	Studies in Performance (Drama)	5
THEA 290A	Text Analysis	5
THEA 290B	Performance Histories	5
THEA 290C	Performance Analysis	5
THEA 294	Future Stages	5

The Isaac Julien Studio Lab

Engaging a range of artistic disciplines, students in this lab will draw upon moving and still images to create visual and sonic languages for production, exhibition and installation. While the commercial imperative, in our digital age, has dictated built-in obsolescence as an integral character of electronic media, this research group, in contrast, will consider the archive as an intrinsic part of a creative method—sampling, remixing, and reproduction. This research group invites artists who want to conceptualize, create, and exhibit works involving moving and still images.

The Isaac Julien Studio Lab has three required courses; take all the courses below and DANM 250F is required to be taken twice.

DANM 250F	Research Group: Isaac Julien Studio Lab	5
DANM 250G	Research Group: Isaac Julien Studio Lab - London Quarter	15

Elective Courses

Electives address areas of needed skill development or thesis topic specialization. In addition to Core and Research Group courses, some students must also take elective courses to meet the total 72-credit requirement, and/or maintain their full-time status in a given quarter. The number of elective courses to be taken is specific to the research group a student is in; see the Planners section below for details. The following DANM courses are approved as electives, but are not offered every year.

DANM 210	Project Design Studio	5
DANM 219	Introduction to Electronics for Artmaking	5
DANM 220	Introduction to Programming for the Arts	5
DANM 281	Special Topics in Digital Arts and New Media	5

Other Suggested Graduate Courses for Electives

Beyond the DANM elective courses listed above, generally any 5-credit graduate-level course may be counted for elective credit. Students are encouraged to consult with their advisors about choosing electives that directly support their thesis research. Independent studies can be counted for elective credit with approval of faculty advisor. Below is a list of suggested courses that may be of interest to DANM students. Please note courses may not be offered every year or may have prerequisites or restrictions on enrollment.

CMPM 244	Artificial Intelligence in Games	5
CMPM 248	Interactive Storytelling	5

CMPM 265	Generative Methods	5
FILM 225	Software Studies	5
FILM 226	Queer Theory and Global Film and Media	5
FILM 228	Moving Image Archives and the Frontiers of Information	5
FILM 230	Expanded Documentary	5
FILM 234	Toward an Ethics of New Media	5
FILM 235	Feminist Media Histories	5
GAME 210	Game Art Intensive	5
GAME 238	Computer Graphics for Games	5
HAVC 233	Topics in Contemporary Art and Visual Culture	5
HAVC 236	Contemporary Art and Theories of Democracy	5
HAVC 241	Decolonizing Nature: Contemporary Art and Ecology	5
HAVC 242	Radical Futurisms	5
HAVC 245	Race and Representation	5
HISC 216	Critical Race/Ethnic Studies	5
HISC 231	From System to Fragment	5
HISC 246	Black Radicalism	5
LALS 204	Migration, Borders, and Borderlands	5
LALS 207	Youth Cultures, Global Capitalism, and Social Change	5
LALS 244	Digital Mapping and Human Geographies	5
LIT 230C	Feminist Theories/Historical Perspectives	5
LIT 240G	History and Tragedy	5
MUSC 203G	Concepts, Issues, and the Practice of Ethnomusicology	5
MUSC 206B	Computer-Assisted Composition	5
MUSC 254L	John Cage: Innovation, Collaboration, and Performance Technologies	5
MUSC 265	Graduate Ensemble Participation	2
MUSC 267	Workshop in Computer Music and Visualization	2
SOCD 293	Studies and Practice for Social Documentation, Filmmaking, and New Media	5
THEA 290A	Text Analysis	5
THEA 290B	Performance Histories	5
THEA 290C	Performance Analysis	5
THEA 294	Future Stages	5

Thesis Requirement

Students are required to complete a thesis project and written paper under the supervision of their thesis committee. The thesis will be an arts project with digital documentation accompanied by a written paper. Thesis projects may be individual or collaborative and may grow out of the research pursued in the research groups during the three quarters prior as well as work developed in core courses. Each student will be expected to complete a paper discussing the student's preparatory research as well as the theoretical significance of

the project. In the case of collaborative projects, each student will be required to submit his or her own paper. During the thesis year, students will make at least two progress presentations to their thesis committee. A completed thesis project and paper must be submitted to and approved by the thesis committee before the degree can be awarded.

Applying for Graduation

By the end of the second week of the quarter of graduation, students complete the Application for Masters Degree form and submit to the DANM graduate adviser. After successfully completing an Oral Defense of their thesis, the student submits their completed thesis to ProQuest via upload, and a hard copy of their thesis title page, signed in ink by all thesis committee members, to the Graduate Division office.

Planners

Experimental Play Research Group Curriculum

	Fall	Winter	Spring
1st Year (Frosh)	DANM 202	DANM 211	DANM 250E
	DANM 250E	DANM 250E	DANM 280
	DANM 280	DANM 280	Elective
2nd Year (Soph)	DANM 201	DANM 215	DANM 280
	DANM 280	DANM 280	DANM 299
	Elective	DANM 299	Elective

Future Stages Research Group Curriculum

	Fall	Winter	Spring
1st Year (Frosh)	DANM 202	DANM 211	THEA 290C
	THEA 290A	THEA 290B	DANM 280
	THEA 294	DANM 280	Elective
	DANM 280		
2nd Year (Soph)	DANM 201	THEA 151	THEA 151
	THEA 294	DANM 280	DANM 280
	DANM 280	DANM 299	DANM 299

Isaac Julien Studio Lab Research Group Curriculum

	Fall	Winter	Spring
1st Year (Frosh)	DANM 202	DANM 211	DANM 250G
	DANM 250F	DANM 250F	DANM 280
	DANM 280	DANM 280	Elective
2nd	DANM 201	DANM 215	DANM 280

Year	DANM 280	DANM 280	DANM 299
(Soph)	Elective	DANM 299	Elective

Film and Digital Media

101 Communications Building
(831) 459-3204
film@ucsc.edu
http://film.ucsc.edu

For Social Documentation

(831) 459-3445
socdoc@ucsc.edu
http://film.ucsc.edu/socdoc

PROGRAMS OFFERED

- Film and Digital Media B.A. (p. 31)
- Film and Digital Media Minor (p. 41)
- Social Documentation M.F.A. (p. 42)
- Film and Digital Media Ph.D. (p. 44)
- Film and Digital Media Designated Emphasis (p. 46)
- Social Documentation Designated Emphasis (p. 46)

UNDERGRADUATE PROGRAM

How do I translate my ideas into images and sounds? What is the role of media in an era of climate crisis? Are documentaries real? Does social media change democracy? How does listening inform our understanding of culture and environment? How can we move toward an algorithmically ethical future? Who and what has been left out of the history of cinema and television? Do streaming services make film history more or less accessible? Who should be responsible for caring for historical media? How can the study of media contribute to forging a more just and sustainable future?

Sound, images and code shape today's reality and our perspectives on the world. Students from diverse backgrounds join our program for its inclusiveness and the opportunity to explore media's past, present and future in relation to race, ethnicity, gender and sexuality, class, intersectionality, community, place, and environment, among others.

The Film + Digital Media general major is neither strictly a theory program nor a production program; it is both—a liberal arts program using a rich toolbox of practical skills and collaborative strategies (writing, research, coding, editing, image making, recording, cinematography) to ask questions critical to our shared future. The major prepares students to analyze and contribute to an ever-evolving and interconnected landscape of film, TV, animation, games, software, social media, and other media forms. Courses in the major connect students with faculty research strengths in nonfiction media, screen representation and race, feminist media, queer theory, experimental and avant-garde movements, animation, games and playable media, global cinema, video and computer art,

personal media, and collections and archives. Students in the program have many opportunities to work with one another and to work closely with faculty members as mentors, critics, and sponsors of independent studies. Together, we share the excitement of remaking the study of film and other media for the 21st century, equipping students to critique and produce in ways that will create a more just, inclusive, equitable, and environmentally sustainable world.

Our curriculum reflects an understanding that intellectual and creative work are related forms of production and inquiry. Undergraduates in Film + Digital Media may enroll in both critical studies and production-focused classes, and some of our classes incorporate overlapping skills and knowledge. Each of our pathways through the major equips our students with a foundation in historical and theoretical concepts, and exposes them to global and cross-cultural perspectives on a constantly widening media spectrum.

GRADUATE PROGRAM

The Doctor of Philosophy (Ph.D.) program in film and digital media challenges the traditionally conceived borders between creative and critical practice. The program enables dialogue between creative practice and theoretical knowledge as related forms of intellectual work and provides the conditions for students to realize a wide range of possible projects, including those that exist across the traditional divides of critical studies and production.

FILM AND DIGITAL MEDIA B.A.

Information and Policies

Introduction

Students in the general film and digital media major develop an understanding of major movements in world cinema and different aesthetic approaches to the medium, while studying the cultural impact of television and the rise of video and digital art in recent decades.

The critical studies concentration is designed for film and digital media majors who have a special aptitude for and interest in the history and theory of film, television, video, and digital media. This rigorous program can help prepare undergraduates for graduate work in critical studies.

The integrated critical practice concentration is designed for film and digital media majors who have a special aptitude for and interest in combining work in critical studies and production. The concentration provides them with a more rigorous pathway through the major and, in their senior year, allows them to work on a senior project that integrates creative and intellectual work.

Students in all facets of the major acquire skills in media analysis while maintaining a broadly based, liberal arts perspective.

Students enrolled in film and digital media production classes have access to audio, video, and digital production and postproduction equipment. Facilities include a digital media

lab; stop-motion animation lab audio recording studio; sound stage with green screen; digital nonlinear editing rooms; video format conversion rooms; a computerized sound effects library; and student equipment checkout. Additionally, computer laboratories equipped for digital image manipulation, web authoring, and interactive interface design and viewing rooms are available. The critical studies facilities include classrooms equipped for high-end film, video, and data projection. The library holdings in film and video history, theory, and literature are complemented by a large collection of films, videos, laser disks, and DVDs, including a diverse range of international feature films, experimental film and video work, animation, silent films, and documentaries.

Some courses offered by the Film and Digital Media Department are restricted in enrollment; admission is based on completion of prerequisites and other specific written application requirements.

Upper-division digital media and production studio courses require coursework to be completed on computers. Instruction in and software for production courses utilizes the macOS platform and primarily consists of Apple and Adobe video production software packages. Many UCSC students purchase laptop computers. Film and digital media students who are considering purchasing a laptop computer for production work are encouraged to consult with the department's operations staff. A list of recommended computer configurations and information regarding education pricing on software packages is available on the Film and Digital Media website.

Academic Advising for the Program

Students seeking advice regarding the major may email fdmadvising@ucsc.edu or call the department's main line at (831) 459-3204. Transfer students please also see the sections below regarding Transfer Information and Policy, Transfer Admission Screening Policy and Getting Started at UCSC as a Transfer Student.

Getting Started in the Major

Though no preparatory classes are required to be successful in the major, prospective students may opt to study introductory film analysis and production courses to become familiar with film and media concepts and techniques.

Program Learning Outcomes

Students who earn a B.A. in film and digital media will gain the skills, knowledge, and understanding that will enable them to:

1. Demonstrate their ability to employ research skills, including the use of appropriate print and technology sources in the discipline, to construct effective arguments.
2. Demonstrate that they understand the pre-production, production, and postproduction digital media and filmmaking process.
3. Demonstrate the relationship between different types of form and meaning through the creation of film and digital media projects or the critical analysis of them.
4. Demonstrate their ability to work collaboratively to produce a film or digital media project.
5. Demonstrate broad knowledge of film and media history internationally.
6. Demonstrate scholarly writing skills appropriate to the discipline of film and digital media.
7. Demonstrate an ability to analyze, interpret, and critique films and media from a variety of theoretical perspectives using the critical vocabulary and methodologies of the discipline.
8. Demonstrate their ability to articulate and defend their research and practice in a critical environment.

Major Qualification Policy and Declaration Process

Major Qualification

Declaration of the Film and Digital Media Major

Prior to declaring the film and digital media major, students must pass FILM 20A and either FILM 20B or FILM 20C with a grade of C or better. Students may choose to take FILM 20P to fulfill the third lower-division requirement but this course does not count toward declaring the major.

Students who are approaching the campus declaration deadline and have not passed FILM 20A and either FILM 20B or FILM 20C, or their transfer equivalents, may petition to declare the major: they will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) to be resolved within at most one more enrolled quarter.

Acceptance into the film and digital media major does not constitute acceptance into any of the concentrations (critical studies or integrated critical practice). Transfer students should also consult the Transfer and Information Policy section for instructions about declaring the major.

Appeal Process

Students may appeal a negative decision within 15 days by submitting an appeal letter to the Film and Digital Media undergraduate advisor. The department will notify the student of the outcome within 15 days of receipt of the appeal.

How to Declare a Major

All students are required to attend a declaration of major workshop in order to officially declare the major. Declaration workshops are offered each quarter before the deadline to declare and are posted on the department's website. Please contact fdmadvising@ucsc.edu with questions.

Transfer Information and Policy

Transfer Admission Screening Policy

Students planning to apply in this major are not required to complete specific major preparation courses for consideration of admission to UC Santa Cruz. Prospective transfer students entering at the junior level are encouraged to complete FILM

20A through UCSC Summer Session prior to their transfer, especially if they will be pursuing one of the concentrations available. Transfer students should be able to complete the general major within two years.

Students who have not fulfilled their general education requirements prior to transferring and pursue one of the film and digital media concentrations, a double major or minor, or study abroad may need additional time to complete their requirements.

Getting Started at UCSC as a Transfer Student

All transfer students must enroll in at least one lower-division major course (FILM 20A, FILM 20B, or FILM 20C) during their first quarter in residence. Transfer students are strongly encouraged to enroll in FILM 20A during the Summer Session preceding their first quarter in residence. At least one course out of FILM 20A, FILM 20B, or FILM 20C must be taken at UCSC. Transfer students who wish to have equivalent lower-division courses count toward their film and digital media major requirements must petition the department unless the courses are articulated at assist.org.

Letter Grade Policy

Students pursuing this major must take the courses required to declare, FILM 20A, FILM 20B and/or FILM 20C for a letter grade.

[Optional Catchall]

Course Substitution Policy

The department allows up to two courses to substitute for major requirements. At least one course out of FILM 20A, FILM 20B, or FILM 20C must be taken at UCSC.

Double Majors and Major/Minor Combinations Policy

Study Abroad

The department strongly encourages students to explore studying abroad while attending UCSC. We allow up to two courses from abroad to substitute for major requirements. See Course Substitution Policy above for details. An exception is allowed for students who are in the Sussex Exchange Program which allows up to three course substitutions if approved by our faculty. The department also offers a direct exchange program with the University of Bergen in Norway.

Honors

Honors in film and digital media are awarded to graduating seniors whose academic performance in their major coursework is judged by a faculty committee to be consistently excellent to outstanding. Students must have at least a cumulative GPA of 3.5 in the major to be considered for Honors.

Three Year Pathway

The Film and Digital Media Department has a three-year pathway designed for students who want to complete their Film and Digital Media B.A. in three years. It is an intensive program which includes all of the courses for the current film

and digital media general major as well as all general education requirements and electives required for the university. Students may complete all courses required for the general major only. No concentration options are available for this pathway, though the general major does allow students to take up to two production courses. Students should begin this pathway in their frosh year to be able to complete the required courses in three years. A sample planner can be found on the university advising website. For more information, contact the undergraduate advisor.

General Film and Digital Media Major

The general film and digital media major requires three lower-division and nine upper-division courses in residence and satisfaction of the senior comprehensive requirement. Students must include among these 13 courses at least one upper-division, 5-credit course that focuses on diversity (i.e., non-Western perspectives; races/ethnicities, genders, classes, sexualities or abilities). A list of courses satisfying the department's diversity requirement is available at the department office. Students in the general film and digital media major may apply for admission to the critical studies concentration (see Critical Studies Concentration below), or the more rigorous integrated critical practice concentration (see Integrated Critical Practice Concentration below) within the major.

Course Requirements

Lower-Division Courses

FILM 20A	Introduction to Film Studies	5
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Two additional 20-level courses:

FILM 20B	Introduction to Television Studies	5
FILM 20C	Introduction to Digital Media	5
FILM 20P	Introduction to Production Technique	5

FILM 20P cannot be used toward declaring the major

Upper-Division Courses

Core Curriculum

Students in the general major complete the following required upper-division core curriculum:

FILM 120	Introduction to Media Theory	5
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One course from each of the following three groups:

Group 1:

FILM 130	Silent Cinema	5
FILM 132A	International Cinema to 1960	5
FILM 132B	International Cinema, 1960 to Present	5

Group 2:

FILM 134A	American Film, 1930-1960	5
FILM 134B	American Film, 1960-Present	5

Group 3:

FILM 136A	Experimental Film and Video	5
FILM 136B	History of Television	5
FILM 136C	Visual Culture and Technology: History of New Media	5
FILM 136D	Documentary Film and Video	5

Plus one course from the following to satisfy the senior comprehensive requirement:

FILM 194A	Film Theory Seminar	5
FILM 194B	Electronic Media Theory Seminar	5
FILM 194C	New Media Theory Seminar	5
FILM 194D	Film History Seminar	5
FILM 194E	International Cinemas	5
FILM 194F	Film and the Other Arts	5
FILM 194G	New(s) Media	5
FILM 194H	Ethics and Documentary Filmmaking	5
FILM 194S	Special Topics Seminar	5

Electives

Five upper-division elective courses are to be chosen from the following:

- up to five additional upper-division critical studies courses in film and digital media (see Electives for the Integrated Critical Practice Concentration for a list of upper-division critical studies courses)
- up to two upper-division courses in film and digital media production (see Integrated Critical Practice Concentration for a list of upper-division production courses)
- up to two upper-division courses offered by other departments or another institution; course substitutions must be pre-approved by the Film and Digital Media Department
- at least one course must focus on diversity, i.e. non-Western perspectives; races/ethnicities, genders, classes, sexualities, or abilities. See list below.

Courses that Satisfy the Diversity Requirement

ANTH 110P	India and Indian Diaspora through Film	5
FILM 132A	International Cinema to 1960	5
FILM 132B	International Cinema, 1960 to Present	5
FILM 165A	Film, Video, and Gender	5
FILM 165B	Race on Screen	5
FILM 165C	Lesbian, Gay, and Queer Film and Video	5
FILM 165D	Asian Americans and Media	5
FILM 165E	Chicana/o Cinema, Video	5
FILM 165G	Gender and Global Cinema	5
HAVC 141O	Sex, Lies, and Surveillance: Contemporary Documentary Arts	5
LALS 122	Media and Nationalism	5

LALS 124	Brazilian Cinema	5
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Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. Film and digital media majors receive detailed information and guidance about the major's DC requirement from the department's undergraduate advisor.

The DC requirement is met by passing one course from each of the two following categories:

First Category

FILM 130	Silent Cinema	5
FILM 132A	International Cinema to 1960	5
FILM 132B	International Cinema, 1960 to Present	5
FILM 134A	American Film, 1930-1960	5
FILM 134B	American Film, 1960-Present	5

Second category:

FILM 194A	Film Theory Seminar	5
FILM 194B	Electronic Media Theory Seminar	5
FILM 194C	New Media Theory Seminar	5
FILM 194D	Film History Seminar	5
FILM 194E	International Cinemas	5
FILM 194F	Film and the Other Arts	5
FILM 194G	New(s) Media	5
FILM 194H	Ethics and Documentary Filmmaking	5
FILM 194S	Special Topics Seminar	5
FILM 196A	Senior Project in Narrative Production	5
FILM 196B	Senior Project in Screenwriting	5
FILM 196C	Senior Documentary Workshop	5
FILM 197	Senior Digital Media Workshop	5

Comprehensive Requirement**Senior Seminar**

Seniors in the general film and digital media major satisfy the comprehensive requirement with a senior seminar (courses in the FILM 194 series).

FILM 194A	Film Theory Seminar	5
FILM 194B	Electronic Media Theory Seminar	5
FILM 194C	New Media Theory Seminar	5
FILM 194D	Film History Seminar	5
FILM 194E	International Cinemas	5
FILM 194F	Film and the Other Arts	5
FILM 194G	New(s) Media	5
FILM 194H	Ethics and Documentary Filmmaking	5
FILM 194S	Special Topics Seminar	5

Planners

Plan One is a guideline for students committed to the major early in their academic career and interested in pursuing a concentration; Plan Two is a guideline for students considering the major after their freshman year.

Students who are interested in the critical studies concentration, or the integrated critical practice concentration should consider Plan One to be better prepared for the application process to the concentrations. However, four-year students following Plan Two may also be able to pursue a concentration and still meet their expected graduation term.

Plan One

Year	Fall	Winter	Spring
1st (frosh)	FILM 20A	FILM lower-division requirement	FILM lower-division requirement
2nd (soph)	FILM 130/ FILM 132/ FILM 134/ FILM 136	FILM 120	FILM 130/ FILM 132/ FILM 134/ FILM 136
3rd (jr)	FILM 130/ FILM 132/ FILM 134/ FILM 136 FILM upper-division elective	FILM upper-division elective	FILM upper-division elective
4th (sr)	FILM upper-division elective	FILM upper-division elective	FILM 194

1st (frosh)	FILM 80A or FILM 80M	FILM lower-division requirement	FILM lower-division requirement
2nd (soph)	FILM 20A	FILM 120	FILM 130/ FILM 132/ FILM 134/ FILM 136
3rd (jr)	FILM 130/ FILM 132/ FILM 134/ FILM 136 FILM upper-division elective	FILM 130/ FILM 132/ FILM 134/ FILM 136 FILM upper-division elective	FILM upper-division elective
4th (sr)	FILM upper-division elective	FILM upper-division elective	FILM 194

Two-Year Transfer Planner

Year	Fall*	Winter**	Spring
3rd (jr)	FILM 20A	FILM lower-division requirement	FILM lower-division requirement
	FILM 130/ FILM 132/ FILM 134/ FILM 136	FILM 120	FILM 130/ FILM 132/ FILM 134/ FILM 136
4th (sr)	FILM upper-division elective	FILM 130/ FILM 132/ FILM 134/ FILM 136 FILM upper-division elective	FILM upper-division elective
	FILM upper-division	FILM upper-division elective	FILM 194

Plan Two

Year	Fall	Winter	Spring
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elective

*Students who completed FILM 20A in UCSC Summer Session or have an approved substitution will be given enrollment priority for an additional upper-division elective.

**The following general education requirements can be satisfied with Film and Digital Media courses: IM, ER, CC, PE-T, PR-E, PR-C, DC. General education requirements not satisfied with Film and Digital Media courses are: MF, SI, SR, TA, C

Critical Studies Concentration

The critical studies concentration provides a more rigorous pathway than the general major and offers classes specifically reserved for seniors who have exceptional abilities. Students are eligible to apply for the critical studies concentration in spring quarter of their junior year, provided they have completed or are currently enrolled in FILM 120 and at least three other upper-division critical studies classes. Applicants must already be declared film and digital media majors in good academic standing.

Students will be asked to submit the following application materials:

- a completed application form
- a one-page statement of purpose
- a sample essay
- a Film and Digital Media (FDM) faculty statement of support (submitted directly to the department)

Application materials and instructions are available at the Film and Digital Media Department office. Applications are reviewed by a committee of film and digital media critical studies faculty. Admission to the critical studies concentration will be granted to students who have excellent grades in film and digital media courses, an outstanding writing sample, a clear statement of purpose, and a strong FDM faculty endorsement. Students may reapply a second time if not accepted, but not later than the first quarter of their senior year. Students accepted in the fall quarter of their senior year are not eligible to propose a student-directed seminar as part of their senior comprehensive requirement.

Course Requirements

Lower-Division Courses

FILM 20A Introduction to Film Studies 5

Two additional 20-level courses:

FILM 20B Introduction to Television Studies 5

FILM 20C Introduction to Digital Media 5

FILM 20P Introduction to Production Technique 5

FILM 20P cannot be used toward declaring the major

Upper-Division Courses

Core Curriculum

Students in the critical studies concentration complete the following required upper-division core curriculum:

FILM 120 Introduction to Media Theory 5

One course from each of the following five groups:

Group 1:

FILM 130 Silent Cinema 5
 FILM 132A International Cinema to 1960 5
 FILM 132B International Cinema, 1960 to Present 5

Group 2:

FILM 134A American Film, 1930-1960 5
 FILM 134B American Film, 1960-Present 5

Group 3:

FILM 136A Experimental Film and Video 5
 FILM 136B History of Television 5
 FILM 136C Visual Culture and Technology: History of New Media 5
 FILM 136D Documentary Film and Video 5

Group 4:

FILM 165A Film, Video, and Gender 5
 FILM 165B Race on Screen 5
 FILM 165C Lesbian, Gay, and Queer Film and Video 5
 FILM 165D Asian Americans and Media 5
 FILM 165E Chicana/o Cinema, Video 5
 FILM 165G Gender and Global Cinema 5

Group 5:

FILM 187 Advanced Topics in Television Studies 5
 FILM 189 Advanced Topics in Digital and Electronic Media Studies 5

And three courses to satisfy the senior comprehensive requirement:

One course from the following:

FILM 194A Film Theory Seminar 5
 FILM 194B Electronic Media Theory Seminar 5
 FILM 194C New Media Theory Seminar 5
 FILM 194D Film History Seminar 5
 FILM 194E International Cinemas 5
 FILM 194F Film and the Other Arts 5
 FILM 194G New(s) Media 5
 FILM 194H Ethics and Documentary Filmmaking 5
 FILM 194S Special Topics Seminar 5

Plus the following course:

FILM 199 Tutorial 5

FILM 199 supervised independent study for thesis or student-directed seminar preparation

Plus one of the following courses:

FILM 192	Directed Student Teaching	5
FILM 195	Senior Thesis/Project	5

Electives

Two upper-division elective courses are to be chosen from the following:

- up to two additional upper-division critical studies courses in film and digital media (see Electives for the Integrated Critical Practice Concentration for a list of upper-division critical studies courses)
- up to one upper-division course in film and digital media production (see the Integrated Critical Practice Concentration for a list of upper-division production courses)
- up to one upper-division course offered by other departments; course substitutions must be pre-approved by the Film and Digital Media Department

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. Film and digital media majors receive detailed information and guidance about the major's DC requirement from the department's undergraduate advisor.

The DC requirement is met by passing one course from each of the two following categories:

First category

FILM 130	Silent Cinema	5
FILM 132A	International Cinema to 1960	5
FILM 132B	International Cinema, 1960 to Present	5
FILM 134A	American Film, 1930-1960	5
FILM 134B	American Film, 1960-Present	5

Second category

FILM 194A	Film Theory Seminar	5
FILM 194B	Electronic Media Theory Seminar	5
FILM 194C	New Media Theory Seminar	5
FILM 194D	Film History Seminar	5
FILM 194E	International Cinemas	5
FILM 194F	Film and the Other Arts	5
FILM 194G	New(s) Media	5
FILM 194H	Ethics and Documentary Filmmaking	5
FILM 194S	Special Topics Seminar	5
FILM 196A	Senior Project in Narrative Production	5
FILM 196B	Senior Project in Screenwriting	5
FILM 196C	Senior Documentary Workshop	5

FILM 197	Senior Digital Media Workshop	5
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Comprehensive Requirement

Seniors in the critical studies concentration must complete the following to satisfy the campus exit requirement:

Choose one of the following courses

FILM 194A	Film Theory Seminar	5
FILM 194B	Electronic Media Theory Seminar	5
FILM 194C	New Media Theory Seminar	5
FILM 194D	Film History Seminar	5
FILM 194E	International Cinemas	5
FILM 194F	Film and the Other Arts	5
FILM 194G	New(s) Media	5
FILM 194H	Ethics and Documentary Filmmaking	5
FILM 194S	Special Topics Seminar	5

Plus the following course

FILM 199	Tutorial	5
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Plus one of the following courses

FILM 192	Directed Student Teaching	5
FILM 195	Senior Thesis/Project	5

Planners

The following is a sample academic plan for students pursuing the critical studies concentration for the film and digital media major.

Plan One

Year	Fall	Winter	Spring
1st (frosh)	FILM 20A	FILM lower-division requirement	FILM lower-division requirement
2nd (soph)	FILM 130/ FILM 132/ FILM 134/ FILM 136	FILM 120	FILM 130/ FILM 132/ FILM 134/ FILM 136
3rd (jr)	FILM 130/ FILM 132/ FILM	FILM upper-division elective	FILM 165/ FILM 187/ FILM 189

134/
FILM 136

170A or FILM 170B plus one other course from the 150 or 170 series. Applicants must already be declared film and digital media majors in good academic standing.

Students will be asked to submit the following application materials:

4th (sr)	FILM 194	FILM 199	FILM 192 or FILM 195
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- a completed application form
- a one-page statement of purpose
- a sample essay
- a FDM faculty statement of support (submitted directly to the department)

Two Year Transfer Planner

Year	Fall*	Winter**	Spring
3rd (jr)	FILM 20A	FILM lower-division requirement	FILM lower-division requirement
	FILM 130/ FILM 132/ FILM 134/ FILM 136	FILM 130/ FILM 132/ FILM 134/ FILM 136	FILM 130/ FILM 132/ FILM 134/ FILM 136
		FILM 120	FILM upper-division elective
4th (sr)	FILM 165/ FILM 187/ FILM 189	FILM 165/ FILM 187/ FILM 189	FILM upper-division elective
	FILM 194	FILM 199	FILM 192 or FILM 195

Application materials and instructions are available at the Film and Digital Media Department office. Student application materials are reviewed by a committee of film and digital media faculty. Admission to the integrated critical practice concentration will be granted to students who have excellent grades in film and digital media courses, an outstanding writing sample, a clear statement of purpose outlining a senior project that integrates critical studies and production work, and a strong FDM faculty endorsement. Students may apply a second time if not accepted, but not later than the first quarter of their senior year.

Course Requirements**Lower-Division Courses**

FILM 20A	Introduction to Film Studies	5
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Two additional 20-level courses

FILM 20B	Introduction to Television Studies	5
FILM 20C	Introduction to Digital Media	5
FILM 20P	Introduction to Production Technique	5

FILM 20P cannot be used toward declaring the major

Upper-Division Courses

Students in the integrated critical practice concentration complete the following required upper-division core curriculum:

FILM 120	Introduction to Media Theory	5
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One course from each of the following five groups**Group 1:**

FILM 130	Silent Cinema	5
FILM 132A	International Cinema to 1960	5
FILM 132B	International Cinema, 1960 to Present	5

Group 2:

FILM 134A	American Film, 1930-1960	5
FILM 134B	American Film, 1960-Present	5

Group 3:

FILM 136A	Experimental Film and Video	5
FILM 136B	History of Television	5

*Students who completed FILM 20A in UCSC Summer Session or have an approved substitution will be given enrollment priority for an additional upper-division elective.

**The following general education requirements can be satisfied with Film and Digital Media courses: IM, ER, CC, PE-T, PR-E, PR-C, DC. General education requirements not satisfied with Film and Digital Media courses are: MF, SI, SR, TA, C

Integrated Critical Practice Concentration

The integrated critical practice concentration (ICPC) provides a more rigorous pathway than the general major and offers classes specifically reserved for seniors with exceptional abilities in both critical studies and production who seek to combine creative and scholarly work. Students are eligible to apply for the integrated critical practice concentration in the last quarter of their junior year, provided they have completed or are currently enrolled in FILM 120; at least three other upper-division critical studies classes; and have completed FILM

FILM 136C	Visual Culture and Technology: History of New Media	5	FILM 185D	Sound and Image in Theory and Criticism	5
FILM 136D	Documentary Film and Video	5	FILM 185R	The Film Remake	5
Group 4:			FILM 185S	Advanced Topics in Film Studies	5
FILM 170A	Fundamentals of Digital Media Production	5	FILM 185X	EyeCandy Seminar	5
FILM 170B	Fundamentals of Film and Video Production	5	FILM 187	Advanced Topics in Television Studies	5
			FILM 189	Advanced Topics in Digital and Electronic Media Studies	5

Group 5:

FILM 194A	Film Theory Seminar	5
FILM 194B	Electronic Media Theory Seminar	5
FILM 194C	New Media Theory Seminar	5
FILM 194D	Film History Seminar	5
FILM 194E	International Cinemas	5
FILM 194F	Film and the Other Arts	5
FILM 194G	New(s) Media	5
FILM 194H	Ethics and Documentary Filmmaking	5
FILM 194S	Special Topics Seminar	5

Two courses to satisfy the senior comprehensive requirement:**The following course:**

FILM 199	Tutorial	5
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Plus one of the following courses:

FILM 195	Senior Thesis/Project	5
FILM 196A	Senior Project in Narrative Production	5
FILM 196B	Senior Project in Screenwriting	5
FILM 196C	Senior Documentary Workshop	5
FILM 197	Senior Digital Media Workshop	5

Electives

Five upper-division elective courses to be chosen from the following:

Two upper-division critical studies courses

In film and digital media chosen from the following:

FILM 160	Film Genres	5
FILM 162	Film Authors	5
FILM 165A	Film, Video, and Gender	5
FILM 165B	Race on Screen	5
FILM 165C	Lesbian, Gay, and Queer Film and Video	5
FILM 165D	Asian Americans and Media	5
FILM 165E	Chicana/o Cinema, Video	5
FILM 165G	Gender and Global Cinema	5
FILM 168	National Cinema and Culture	5
FILM 168M	National Cinema and Culture: Morocco	5
FILM 180	Writing About Film, Television, and Digital Media	5

Three upper-division production courses

In film and digital media chosen from the following:

FILM 150	Screenwriting	5
FILM 151	Film Directing	5
FILM 170A	Fundamentals of Digital Media Production	5
FILM 170B	Fundamentals of Film and Video Production	5
FILM 171A	Sound	5
FILM 171C	Special Topics Workshop: Found Footage	5
FILM 171D	Social Information Spaces	5
FILM 171F	Special Topics Workshop: Autobiographical Film	5
FILM 171S	Special Topics in Film and Digital Media Production	5
FILM 172	Narrative Video Workshop	5
FILM 173	Narrative Digital Media Workshop	5
FILM 175	Documentary Video Workshop	5
FILM 176	Experimental Video Workshop	5
FILM 177	Digital Media Workshop: Computer as Medium	5
FILM 178A	Personal Computers in Film and Video	5
FILM 178B	Advanced Personal Computers in Film and Video	5
FILM 179A	Special Topics in Animation	5
FILM 179B	Documentary Animation Workshop	5

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. Film and digital media majors receive detailed information and guidance about the major's DC requirement from the department's undergraduate advisor.

The DC requirement is met by passing one course from each of the two following categories:

First category

FILM 130	Silent Cinema	5
FILM 132A	International Cinema to 1960	5
FILM 132B	International Cinema, 1960 to Present	5
FILM 134A	American Film, 1930-1960	5
FILM 134B	American Film, 1960-Present	5

Second category

FILM 194A	Film Theory Seminar	5
FILM 194B	Electronic Media Theory Seminar	5
FILM 194C	New Media Theory Seminar	5
FILM 194D	Film History Seminar	5
FILM 194E	International Cinemas	5
FILM 194F	Film and the Other Arts	5
FILM 194G	New(s) Media	5
FILM 194H	Ethics and Documentary Filmmaking	5
FILM 194S	Special Topics Seminar	5
FILM 196A	Senior Project in Narrative Production	5
FILM 196B	Senior Project in Screenwriting	5
FILM 196C	Senior Documentary Workshop	5
FILM 197	Senior Digital Media Workshop	5

requirement requirement

2nd (soph)

FILM 130/
FILM 132/
FILM 134/
FILM 136

FILM 120

FILM 130/
FILM 132/
FILM 134/
FILM 136

FILM upper-division elective

3rd (jr)

FILM 170A or
FILM 170B

FILM 130/
FILM 132/
FILM 134/
FILM 136

FILM upper-division elective

FILM upper-division production

Comprehensive Requirement

One of the following courses

Seniors in the integrated critical practice concentration must complete one of the following courses:

FILM 195	Senior Thesis/Project	5
FILM 196A	Senior Project in Narrative Production	5
FILM 196B	Senior Project in Screenwriting	5
FILM 196C	Senior Documentary Workshop	5
FILM 197	Senior Digital Media Workshop	5

4th (sr)

FILM upper-division production

FILM 199

FILM 195 or
FILM 196 or
FILM 197

FILM 194

FILM upper-division production

Plan Two

Year

Fall

Winter

Spring

1st (frosh)

FILM 80A or
FILM 80M

FILM lower-division requirement

FILM lower-division requirement

Plus the following course

FILM 199	Tutorial	5
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Planners

The following are two recommended academic plans for students pursuing the integrated critical practice concentration for the film and digital media major. Plan One is a guideline for students committed to the major early in their academic career; Plan Two is for students considering the major.

Students who are interested in the integrated critical practice concentration should consider Plan One to be better prepared for application to production studio classes in their junior year. However, four-year students following Plan Two should be able to pursue a concentration and still meet their expected graduation term. FILM 20A is not guaranteed to any incoming frosh and most four-year students will use Plan Two as a guideline.

2nd (soph)

FILM 20A

FILM 120

FILM 130/
FILM 132/
FILM 134/
FILM 136

FILM 130/
FILM 132/
FILM 134/
FILM 136

FILM upper-division elective

3rd (jr)

FILM 170A or
FILM 170B

FILM 130/
FILM 132/
FILM 134/
FILM 136

FILM upper-division elective

Plan One

Year	Fall	Winter	Spring
1st (frosh)	FILM 20A	FILM lower-division	FILM lower-division

FILM upper-

			division production
4th (sr)	FILM upper- division production FILM 194	FILM upper- division production FILM 199	FILM 195/ FILM 196/ FILM 197

Two-Year Transfer Planner

Year	Fall*	Winter**	Spring
3rd (junior)	FILM 20A FILM 130/ FILM 132/ FILM 134/ FILM 136	FILM lower- division requirement FILM 120 FILM 170A or FILM 170B	FILM lower- division requirement FILM 130/ FILM 132/ FILM 134/ FILM 136 FILM upper- division production
4th (senior)	FILM 130/ FILM 132/ FILM 134/ FILM 136 FILM upper- division production FILM 194	FILM upper- division elective FILM upper- division production FILM 199	FILM upper- division elective FILM 195/ FILM 196/ FILM 197

*Students who completed FILM 20A in UCSC Summer Session or have an approved substitution will be given enrollment priority for an additional upper-division elective.

**The following general education requirements can be satisfied with Film and Digital Media courses: IM, ER, CC, PE-T, PR-E, PR-C, DC. General education requirements not satisfied with Film and Digital Media courses are: MF, SI, SR, TA, C

FILM AND DIGITAL MEDIA MINOR

The minor in film and digital media offers a foundation in visual culture and contributes important scholarly techniques of value to other disciplines. Students earn a minor in film and digital media by completing eight courses: FILM 20A and either FILM 20B or FILM 20C, and six upper-division courses including three from the core curriculum of the general major and three electives. There is no production component in the minor, nor is there a comprehensive requirement.

Declaring the Film and Digital Media Minor

Students who pass FILM 20A, FILM 20B or FILM 20C are eligible to declare the film and digital media minor. To enroll in these classes, students contact the instructor and request a permission code.

Course Requirements

Lower-Division Courses

Complete the following course:

FILM 20A	Introduction to Film Studies	5
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Plus one of the following courses:

FILM 20B	Introduction to Television Studies	5
FILM 20C	Introduction to Digital Media	5

Upper-Division Courses

Students in the minor must complete the following upper-division core curriculum.

One course from each of the following three groups:

Choose one of the following courses:

FILM 130	Silent Cinema	5
FILM 132A	International Cinema to 1960	5
FILM 132B	International Cinema, 1960 to Present	5

Plus one of the following courses:

FILM 134A	American Film, 1930-1960	5
FILM 134B	American Film, 1960-Present	5

Plus one of the following courses:

FILM 136A	Experimental Film and Video	5
FILM 136B	History of Television	5
FILM 136C	Visual Culture and Technology: History of New Media	5
FILM 136D	Documentary Film and Video	5

And three upper-division elective courses to be chosen from the following:

Any three additional upper-division film and digital media critical studies courses other than production studio courses (FILM 150, FILM 151, FILM 170A through FILM 179B) that have not been used to satisfy the above upper-division core curriculum. One of the electives may be substituted from another department or institution. Course substitutions must be approved by the Film and Digital Media Department.

FILM 130	Silent Cinema	5
FILM 132A	International Cinema to 1960	5
FILM 132B	International Cinema, 1960 to Present	5
FILM 134A	American Film, 1930-1960	5
FILM 134B	American Film, 1960-Present	5
FILM 136A	Experimental Film and Video	5
FILM 136B	History of Television	5

FILM 136C	Visual Culture and Technology: History of New Media	5	a range of under-recognized communities, problems, and structural inadequacies.
FILM 136D	Documentary Film and Video	5	Upon completion of the program, Master's of Fine Arts graduates will be qualified to enter a range of documentary-related professions. Degree holders may work within industries such as public broadcasting, as independent producers and artists, at archives or museums, or within organizations committed to exploring the relationships between media and social change. As a terminal degree, M.F.A. degree holders are also qualified to teach arts, documentary and/or digital media at institutions of higher learning.
FILM 160	Film Genres	5	
FILM 161B	Documentary Animation	5	
FILM 162	Film Authors	5	
FILM 165A	Film, Video, and Gender	5	
FILM 165B	Race on Screen	5	
FILM 165C	Lesbian, Gay, and Queer Film and Video	5	
FILM 165D	Asian Americans and Media	5	
FILM 165E	Chicana/o Cinema, Video	5	
FILM 165G	Gender and Global Cinema	5	
FILM 168	National Cinema and Culture	5	
FILM 168M	National Cinema and Culture: Morocco	5	
FILM 180	Writing About Film, Television, and Digital Media	5	
FILM 185D	Sound and Image in Theory and Criticism	5	
FILM 185R	The Film Remake	5	
FILM 185X	EyeCandy Seminar	5	
FILM 187	Advanced Topics in Television Studies	5	
FILM 189	Advanced Topics in Digital and Electronic Media Studies	5	
FILM 194A	Film Theory Seminar	5	
FILM 194B	Electronic Media Theory Seminar	5	
FILM 194C	New Media Theory Seminar	5	
FILM 194D	Film History Seminar	5	
FILM 194E	International Cinemas	5	
FILM 194F	Film and the Other Arts	5	
FILM 194G	New(s) Media	5	
FILM 194H	Ethics and Documentary Filmmaking	5	
FILM 194S	Special Topics Seminar	5	

Objectives

The Social Documentation M.F.A. program aims to train graduate students in critical thinking, social science analysis, arts-based approaches, and ethical standards for engaging with and documenting underrepresented communities. Additionally, students receive training in video production, animation and new media. In supplement to this broad curriculum, the FDM Department offers one-to-two-day master classes in audio and visual production taught by professionals in the field. The program's advisor structure requires M.F.A. students to work with faculty from FDM and across the UCSC campus, providing students with a broad range of research approaches and aesthetic models for documentary practice. For example, a student may take courses in anthropology, feminist studies, history, literature and sociology wherein they learn social science and humanities research methodologies related to their topic of study. And a student will take a variety of required and elective courses within the Film and Digital Media Department where they will engage with the history and theory of documentary representations and receive technical instruction and professionalization in a variety of production and post-production techniques.

The core curriculum concentrates on critical approaches to the production of documentary media and on the role of documentary in framing and effecting social change. M.F.A. candidates may work in film or video; in photography (a book, a photo essay, gallery exhibition and/or time-based media); animation and multimedia; audio productions; and/or transmedia and web-platform projects. Graduates are expected to generate work that will have an impact on the world outside the academy and in the public realm. The M.F.A. thesis project, which constitutes the culmination of the two years of study, is to be given a public exhibition and becomes the springboard for continuing work after graduation.

Requirements

Course Requirements

The Social Documentation M.F.A. program offers a required and foundational core curriculum in the theory, history and practice of social documentary. Students work with three faculty advisors to design an individualized course of study that supplements the core curriculum with classes that support the student's specific project, both in terms of content and technical production. Toward that end, students take elective courses in their area of interest in the social sciences and/or humanities,

SOCIAL DOCUMENTATION M.F.A.

Introduction

The Master's of Fine Arts (M.F.A.) in Social Documentation (SocDoc) is an innovative and unique interdisciplinary two-year program in the Film and Digital Media Department (FDM) that trains students to critically analyze, frame and reflect upon contemporary social issues through the art of documentary media. SocDoc M.F.A. students produce documentary video, photography and other media throughout the program culminating in well-researched, socially engaged and aesthetically crafted thesis project. In a rapidly expanding and changing field, the Social Documentation M.F.A. invites students to investigate critical social issues through an interdisciplinary approach that fuses arts based, social science and humanities research methods to the art of documentary media and storytelling. We don't just tell a story; our students go beyond the story to place individuals in context and struggles in history, deepening the public's understanding of the societies in which we live and with which we connect. Documentaries produced in the program have called attention to

write and develop a written thesis, and then create a final documentary media project.

A total of 72 credits is required to complete the SocDoc M.F.A. Required courses include seminars on social documentary history; practice, theory, and social science research; and technical instruction on production and post-production processes and techniques. Full-time enrollment is required.

First Year (32 credits):

SOCD 200	Approaches to Social Documentation	5
SOCD 201A	Introduction to Documentary Field Production and Editing	5
FILM 202	Pedagogy in Film and Digital Media	2
SOCD 201B	Advanced Documentary Field Production and Editing	5
SOCD 201C	Project Planning for the Social Documentary	5
SOCD 202	Multiple-Platform Social Documentary Production	5
SOCD 203	Documentary Research Methods and Social Science Representation	5

Second Year (25 credits):

SOCD 293	Studies and Practice for Social Documentation, Filmmaking, and New Media	5
SOCD 294A	Production/Analysis/Editing	5
SOCD 294B	Production/Analysis/Editing	5
SOCD 294C	Production/Analysis/Editing	5
SOCD 295	Project Completion	5

Additional Course Requirements

Electives (15 credits)

In addition to the required courses above, 15 credits of electives (offered by departments) are identified individually in consultation with the director of Graduate Studies and faculty advisors. SocDoc students choose elective courses based on their research needs and interests and will be advised to take graduate elective courses offered by their thesis advisors. Students may also elect to take independent studies with their advisors as a form of concentrated study in a specialized area.

Advancing to Candidacy

To satisfy requirements for the M.F.A. degree, a student must complete and pass all of the required first-year courses and electives, assemble a committee of three advisors, develop a thesis proposal and successfully pass a qualifying examination (QE). The thesis proposal serves as the basis for the QE and includes: a description of the subject to be documented, a treatment or narrative outline, a work plan including budget and timeline, and a preliminary annotated bibliography and filmography/videography of related works.

Approval of the written proposal and satisfactory completion of the qualifying examination is a prerequisite for advancement to further coursework or fieldwork on the master's project. The successful pre-qualifying examination proposal should address the following questions:

- What is the story to be told?
- What is the stylistic approach?
- What is the social analysis that will guide, inform, and underwrite the story?
- How will that analysis be enacted in the documentary?
- What kinds of evidence will be generated to persuade the audience that the analysis is accurate?
- How will the documentary use social analysis to make the personal political, and how will it move from analysis to critique?

The second year is focused on completion of the final documentary project, required for the M.F.A. degree. This project must reflect original research and creative activity while demonstrating a command of the field or topic of study. With an understanding of budgetary, equipment, and time limitations, students' projects should reflect a level of quality appropriate for publication, exhibition, or broadcast (including digital/web-cast).

Typically, the expectation in each medium is as follows:

Documentary Film/Video. One 20-minute documentary suitable for professional distribution and public exhibition.

Documentary Photography. One major exhibition on or off campus with a minimum of 10-20 images with text, and/or a 10-minute multimedia presentation and/or a publication-ready book of photographs and essay(s).

Documentary Animation. One complete documentary animation suitable for professional distribution and public exhibition.

Transmedia Projects. One complete documentary transmedia project suitable for professional distribution and public exhibition.

Audio Documentary/Sound Recording. One 20-30-minute documentary suitable for radio broadcast or museum/public installation.

The final M.F.A. critique consists of a presentation and discussion of the student's thesis work with their three advisors. In addition, every project must be accompanied by a written M.F.A. thesis describing its relationship to its field and must document its research via field notes, bibliographies, archival searches, filmographies, videographies, and photography searches. Final deliverables also include a basic website for the thesis project along with production stills, a press kit, and a draft civic engagement campaign. A public presentation of the project will complete graduation requirements. All materials will be filed in digital form and archived for future reference and access. All final projects, in every medium, must be

submitted in the formats specified by the director of Graduate Studies.

[Optional Catchall]

Applying for Graduation

You must submit an Application for the M.F.A. to your graduate coordinator for review by the end of the second week of the quarter in which you intend to receive the certificate. The graduate coordinator will forward your application to the Graduate Division.

Please see Registration Requirements for all Graduate Degrees for details about registration requirement the quarter you intend to graduate.

For additional forms and information please visit the UCSC Graduate Division website.

FILM AND DIGITAL MEDIA PH.D.

Introduction

Focusing on a diverse range of cultural production that includes cinema, television, video art, and Internet-based media, Ph.D. students interrogate the historical, aesthetic, political, ideological, and technological aspects of these media forms across a range of international contexts, investigating their points of connection and convergence as well as their relationship to broader cultural and historical change. The program thus prepares students for intellectually informed creative practice as well as theoretical and critical production in a range of environments, not limited to traditional academic contexts.

Advancement to Candidacy

Course Requirements

- A minimum of 108 units of study in coursework at UC Santa Cruz. Residence for a minimum of six quarters.
- Applicants who already hold an M.A. or M.F.A. degree may petition to waive up to 30 credits of coursework; including up to two of the six required Film and Digital Media (FDM) Ph.D. electives; such a waiver is subject to the approval of the director of Graduate Studies. Such a waiver would advance the normative timeline described below; students will determine the exact timing of milestones with their advisors and the director of Graduate Studies.
- Residence for a minimum of six quarters.
- When in residence, students will take a minimum of 36 credits per year until advancement to candidacy.
- First-year students will be required to take the three foundational courses (FILM 200A-FILM 200B-FILM 200C), FILM 202 (Pedagogy in Film and Digital Media, 2 credits), plus at least two film and digital media graduate elective courses.*

- Second-year students must then take at least four film and digital media graduate elective courses.*
- FILM 203 (Professional Development in Film and Digital Media) is a required course, to be taken after the first year.
- Students are not permitted to enroll in FILM 295 (Directed Reading) classes during their first year and are limited to one during their second year, unless they enter the program with an M.A. or M.F.A.
- Third-year students arrange three Directed Readings (FILM 295) to prepare for the three topic areas of their qualifying examination.
- Prior to advancing to candidacy, students will continue to meet the minimum number of credits with other 2-5 credit elective courses as appropriate.
- A student will thus take at least nine film and digital media graduate courses over the degree, not including FILM 295, FILM 297 and FILM 299 classes.
- The remaining course units may be selected from film and digital media graduate courses or graduate courses other departments, subject to approval from the student's faculty advisor.
- Students must obtain permission from the director of Graduate Studies, their faculty advisor to take advanced undergraduate courses.
- Students are expected to complete at least one year of supervised teaching as part of the degree requirements.

*Non-film and digital media graduate courses that are taught by film and digital media faculty can count as film and digital media graduate electives. Graduate electives in this category are listed in the annual and quarterly courses posted on the Programs page on department's website, select Courses.

Foreign Language Requirements

Students must demonstrate proficiency in a language other than English. This may include a computer programming language instead of a natural language when such a language is integral to the student's field of study. The language requirement may be satisfied in one of two ways:

- by passing an upper-division course in a language related to the student's research;
- by passing a reading proficiency test administered by a qualified person approved by the director of Graduate Studies.

A student must pass the language requirement before taking Ph.D. qualifying examinations. There are three exceptions. (Documentation for the exception must be received and approved by the director of Graduate Studies at least two months before the qualifying examination.)

- The “foreign” language requirement may be waived for a non-English native speaker who has passed the proficiency test in English required for admission.
- The requirement may be waived for a student who is a native speaker of another language in addition to English. The student must submit a statement to the director of Graduate Studies attesting to their proficiency in the additional native language.
- The requirement may be waived if a student has proof of proficiency in a language other than English in the form of a language major or minor from recent undergraduate or master’s level education or equivalent. This must have been completed within the past five years at an accredited institution.

Teaching Requirement

Students are expected to complete at least one year of supervised teaching as part of the degree requirements.

Pre-Qualifying Requirements

During the first year of study in FILM 200A-FILM 200B-FILM 200C classes, students will be introduced to the methodologies of developing a critical practice approach. This will occur while students simultaneously strengthen, with the appropriate elective classes, areas of theory or practice that pertain to their focus.

During the second year, the student will focus on selecting classes from the film and digital media elective series numbered FILM 200–FILM 289. Students will also be encouraged to take electives from other graduate programs on campus.

At the end of the second year, students undergo a second year review which functions as the master’s examination. Students will submit four to five coursework projects for the examination. One of these must be the final project from FILM 200C. Students will also submit a statement about that work and its contexts, which will form the basis for oral examination questions by faculty members.

Students may nominate faculty members to the committee. The student’s faculty advisor and the director of Graduate Studies will assemble the committee, taking into account the student’s nominations. The committee will have a minimum of three faculty members, at least two of whom must be from the film and digital media faculty. One of those two must be the faculty advisor, who will chair the meeting. The committee must also include the director of Graduate Studies. (The director of Graduate Studies will not necessarily sit on the student’s committee for future exams/reviews.) The examination is closed; only the student and the faculty committee will be present.

For students entering without a master's degree, the committee will recommend one of three grades for the M.A. examination: fail, pass, or pass with permission to proceed. Students who fail may retake the oral component of the examination one time. A student with a pass only may leave the program with the degree of master of arts. Students who pass with permission to proceed may enter the third year of coursework toward the Ph.D. For

students entering with a master's degree, the committee will discuss the result of the review and its recommendations for further progress in the program, including the timeline to the Ph.D. qualifying examination (QE).

Qualifying Examination

The third year will be spent developing three qualifying examination topics that will lead to the dissertation in close consultation with the student’s faculty advisor. (This may occur earlier for students who enter with a master’s degree.) Students work with three faculty members to develop three distinct topic areas with a corresponding bibliography/mediagraphy in FILM 295 (Directed Reading). Topic areas must be pre-approved by the director of Graduate Studies who will ensure that the breadth requirement is met.

Students will also begin assembling a qualifying examination (QE) committee. The QE committee will be comprised of three faculty members, at least one of whom must be from another discipline at UC Santa Cruz or from another campus. Students will also nominate a faculty member to chair the examination committee. The chair should be a tenured faculty member from the Film and Digital Media Department, holding a Ph.D., but should not be the student’s primary faculty advisor or the person who will chair the dissertation. The composition of the QE committee must be approved by the Graduate Division and must be submitted to the director of Graduate Studies at least five weeks prior to the written examination.

The qualifying examination will typically be scheduled for the fall of the fourth year and no later than the end of the fourth year. (Students who enter with a master’s degree may be eligible to take the qualifying examination before their fourth year.) The QE will consist of a written examination and an oral examination. A student who fails the Ph.D. qualifying examination will be permitted to re-take it one time. During the qualifying examination quarter, students may enroll in up to two FILM 299 (Thesis Research) classes with members of their committee.

Post-Qualifying Examination Requirements

No later than two academic quarters after successfully passing the qualifying examination, students must submit and defend a Dissertation Prospectus. The candidate’s dissertation committee must approve this prospectus. After the dissertation prospectus has been approved, the student will schedule a dissertation colloquium open to all film and digital media faculty and graduate students. The colloquium can be scheduled before or shortly after the official advancement to candidacy.

Students will advance to candidacy once they have successfully:

- completed all required coursework with satisfactory grade;
- satisfied the language requirement;
- passed the Ph.D. qualifying examination;
- organized an approved dissertation committee, through the dissertation nomination form; and

- defended a dissertation prospectus and had it approved by their dissertation committee.

[Optional Catchall]

Dissertation

Dissertation

Completion of the Degree

Upon successful advancement to candidacy, students must then complete the following requirements for the Ph.D.

The dissertation, or Ph.D. thesis, is to be an original contribution of high quality to the field of film and digital media. If a student's thesis contains a substantial creative component, the thesis project must also include a written component of no less than 75 pages. The dissertation must be approved by a committee consisting of a minimum of three faculty members. The dissertation chair must be a film and digital media faculty member and at least two committee members must be from the film and digital media faculty. If the dissertation chair does not hold a Ph.D. degree, then the majority of the remaining committee members must hold Ph.D.s. Also, the majority of the dissertation committee membership shall be members of the Santa Cruz Division of the Academic Senate.

The Ph.D. candidate shall submit the dissertation providing a minimum of 45 days for the committee members to review it. Once the committee has deemed it ready to defend, the candidate will work with the department and committee to schedule the oral dissertation defense.

Dissertation Defense

The oral defense will be comprised of a brief introduction of the dissertation's form and content, and an articulation of the scholarly and artistic intervention it forges; the student will then answer questions posed by their dissertation committee. Invited members of the academic community may attend the defense, but the discussion will remain among the candidate and the committee.

Once the student has passed the oral dissertation defense, responds to any questions or suggestions for revisions, and has the dissertation approved by the committee, they will be eligible to "Announce Candidacy for Ph.D." by submitting the dissertation and required documents to the Division of Graduate Studies.

Academic Progress

Normative time for completion of the program is six years. The first two years of the program are primarily devoted to coursework. Preliminary exams for the master's degree occur in the spring of the second year. By the end of the third year, students should have formulated a dissertation topic and proposal deriving from their work in that year and should have nominated a Ph.D. qualifying examination committee and dissertation committee. Qualifying examinations for advancement to Ph.D. candidacy typically occur in the fall of the fourth year. These are approximate timelines, subject to

variation depending on previous degree(s), transfer credits, substitutions, progress in program, leaves and/or other factors.

Applying for Graduation

You must submit an application for the Ph.D. to your graduate coordinator for review by the end of the second week of the quarter in which you intend to receive the certificate. The graduate coordinator will forward your application to the Graduate Division.

Please see Registration Requirements for all Graduate Degrees for details about registration requirement the quarter you intend to graduate.

For additional forms and information please visit the UCSC Graduate Division website.

[Optional Catchall]

FILM AND DIGITAL MEDIA DESIGNATED EMPHASIS

Introduction

UC Santa Cruz graduate students enrolled in doctoral programs may obtain a designated emphasis in film and digital media as part of their Ph.D. degree.

Requirements

Students must meet the following requirements in order to obtain the designated emphasis:

Committee Composition and Departmental Approvals

Secure approval from a member of the film and digital media core faculty to serve as the advisor for the designated emphasis.

Course Requirements

Successfully complete four graduate courses (not independent studies) taught by either core or affiliated faculty of the film and digital media Ph.D. program. The courses must be pre-approved by the student's designated emphasis advisor.

Writing, Research and/or Teaching Requirements

Submit a significant piece of writing, or a project that includes both writing and creative practice, that demonstrates competence in the field of film and digital media. A writing submission could take the form of a seminar paper or dissertation chapter. A writing/creative project may be constituted from a range of possible media such as film, video, web-based or other digital media. The submitted project must meet the approval of the student's film and digital media advisor.

[Optional Catchall]

SOCIAL DOCUMENTATION

DESIGNATED EMPHASIS

Introduction

UC Santa Cruz graduate students enrolled in doctoral programs may obtain a designated emphasis in social documentation as part of their doctoral or master of fine arts degree.

Requirements

Students must meet the following requirements in order to obtain the designated emphasis:

Committee Composition and Departmental Approvals

Secure approval from a member of the Film and Digital Media (FDM) faculty to serve as the adviser for the designated emphasis.

Have one faculty member from the FDM faculty serve on the student's qualifying examination committee or dissertation committee.

Course Requirements

Successfully complete four graduate courses within the Social Documentation Program curriculum. The courses must be pre-approved by the student's FDM faculty adviser. In most cases, these courses would include SOCD 200, SOCD 202, and two others, but may be adapted to fit the needs of particular students.

Writing, Research and/or Teaching Requirements

Submit a significant piece of documentary work that demonstrates competence in the field of social documentation. This project could consist of a digital video or photography project, or possibly an audio or web-based piece, focused on the student's area of study and thus constituting a parallel investigation into the subject of the Ph.D. or M.F.A. dissertation. In certain circumstances, a documentary project on a subject other than the dissertation could be approved, but generally that would not be the case. The submitted project must meet the approval of the student's FDM faculty adviser.

[Optional Catchall]

History of Art and Visual Culture

D-201 Porter College
(831) 459-4564
havic@ucsc.edu
<https://havic.ucsc.edu>

PROGRAMS OFFERED

History of Art and Visual Culture B.A. (p. 47)

History of Art and Visual Culture Minor (p. 53)

Visual Studies Ph.D. (p. 53)

Visual Studies Designated Emphasis (p. 55)

UNDERGRADUATE PROGRAM

In the History of Art and Visual Culture (HAVC) Department, students study the production, use, form, and reception of visual products and cultural manifestations past and present. Objects of study include paintings, sculptures, and architecture, which are within the traditional purview of art history, as well as art and non-art objects and visual expressions that sit beyond disciplinary boundaries. The HAVC Department offers courses covering a wide variety of material from the cultures of Africa, the Americas, Asia, Europe, the Mediterranean, and the Pacific Islands, including media as diverse as ritual, performative expression, bodily adornment, landscape, the built environment, installation art, textiles, manuscripts, books, photography, film, video games, apps, websites, and data visualizations.

HAVC students at UC Santa Cruz investigate complex questions concerning the social, political, economic, religious, and psychological impact of images from the perspective of their producers, users, and viewers. Visual objects play a central role in the formation of values and beliefs, including the perception of gender, sexuality, ethnicity, race, and class. Through attentive historical study and close analysis, students are taught to recognize and assess these systems of value, and are introduced to theoretical and methodological frameworks for future research.

Courses for Non-Majors

HAVC courses numbered 10-85 are lower-division introductory courses appropriate for non-majors. Most upper-division HAVC courses are also open to non-majors, but we recommend first completing at least one year of university coursework before taking upper-division classes.

GRADUATE PROGRAM

The Visual Studies Ph.D. offers an interdisciplinary program focused on visual-cultural scholarship, comprising specialized coursework and individual dissertation research in close coordination with faculty supervision. The expansive expertise of our diverse faculty addresses, and offers a broad scope of supervisory possibilities in researching, a variety of art forms and visual cultures with historical and contemporary perspectives and with global reach, including such regions as Sub-Saharan Africa, the Middle East, North America, Latin America, the Indigenous Americas (including pre-colonial California), Asia, Europe, the Mediterranean, and the Pacific Islands. Our program provides students with unparalleled opportunities to consider the role of social, political, and cultural forces in both shaping and being shaped by assorted modes of visual experience and their relations as well as to complex workings of multisensory perception. Areas of particular concern, both historical and current, include spatial and visual theories, environmental, social, and racial justice, colonial and decolonial visual culture, Anthropocene and Indigenous studies.

HISTORY OF ART AND VISUAL

CULTURE B.A.

Information and Policies

Introduction

The history of art and visual culture (HAVC) curriculum guides students in acquiring skill in critical thinking about art and visual culture, leading to a bachelor of arts (B.A.) degree. Each student who chooses to major in HAVC devises an individual study plan with the undergraduate advisor. The lower-division HAVC courses numbered 10-85, intended for general education students and prospective majors, provide an introduction to the field of visual culture according to geographic areas and visual traditions within those areas. Upper-division HAVC courses numbered 110-189 cover a broad range of issues in various aspects of world cultures from earliest times to the present. The most advanced HAVC courses, numbered in the 190-191 series, are taught in seminar format. Students also have the opportunity to take independent study courses and write senior theses.

Academic Advising for the Program

Undergraduate Advisor

The undergraduate advisor offers specific information about navigating through the program and the curriculum and assists students with academic planning, requirements, policies and procedures, learning support, scholarships, and special opportunities for undergraduate research. Please contact the HAVC undergraduate advisor at havc@ucsc.edu.

Faculty Advisors

Faculty are the best resource for learning about the philosophies and foundations of history of art and visual culture. Faculty advisors can work individually with students to develop a specific course of study, recommend additional courses of interest, and discuss long-term career goals including education beyond the baccalaureate. A faculty advisor is selected by the student within one quarter of declaring the major or minor. Students choose a faculty advisor who specializes in their field of interest within HAVC.

Getting Started in the Major

Lower-Division Coursework

It is recommended that students begin by taking four lower-division HAVC courses from four different geographic regions.

Languages

All majors are encouraged to study at least one foreign language. Graduate programs in visual culture, art history, and other related disciplines generally require competence in one or more languages beyond English. Students are encouraged to consult with their faculty advisor to discuss an appropriate course of language study.

Program Learning Outcomes

Graduates from the history of art and visual culture B.A. program will have demonstrated the following:

Program Learning Outcome (PLO) 1: Breadth of Cultural Knowledge

Students will be able to demonstrate an appreciation for, and foundation in, visual studies grounded in a range of historical, social, cultural, and ideological perspectives.

PLO 2: Critical Thinking

Students will be able to apply critical thinking skills that will enable them to analyze and solve problems through observation, experience, reflection, interpretation, analysis, evaluation, and/or explanation of visual, material, and historical cultural forms and values. Students will demonstrate critical thinking skills through oral and/or written communication.

PLO 3: Research Proficiency

Students will be able to formulate research questions that expand their knowledge of art and visual culture. Students will be able to apply research methods to answer these questions by consulting the current literature and developing independent results through archival, library, or field research.

PLO 4: Written Communication

Students will be able to present clear visual and historical analysis and interpretation in writing. Students will be able to demonstrate standard writing conventions in visual studies appropriate to purpose and context.

Major Qualification Policy and Declaration Process

Major Qualification

To be eligible to declare the major, students must pass two lower-division HAVC courses chosen from two different geographic regions listed below:

- HAVC courses 10-19: Africa and its Diaspora
- HAVC courses 20-29: Asia and its Diaspora
- HAVC courses 30-49: Europe and the Americas
- HAVC courses 50-59: Mediterranean
- HAVC courses 60-69: Native Americas
- HAVC courses 70-79: Oceania and its Diaspora

HAVC 80 may be used to fulfill a lower-division requirement for one of the following geographic regions: 10s (Africa), 60s (Native Americas), or 70s (Oceania).

Upper-division HAVC courses may also be used to meet the major qualification criteria, as long as the lower- and upper-division courses cover two different geographic regions.

Transfer students should also consult the Transfer Information and Policy section.

Appeal Process

Students who are informed that they are not eligible to declare the major may appeal this decision by submitting a letter to the department chair within 15 days from the date of the

notification. Within 15 days of receipt of the appeal, the department will notify the student and college of the decision. Students should submit their appeal via email to havc@ucsc.edu.

How to Declare a Major

Students who are eligible to declare the HAVC major must consult with the undergraduate advisor. Please email havc@ucsc.edu to make an appointment or visit during drop-in hours.

Transfer Information and Policy

Transfer Admission Screening Policy

Students planning to apply in this major are not required to complete specific major preparation courses for consideration of admission to UC Santa Cruz. Transfer students are, however, encouraged to complete some of their lower-division history of art and visual culture requirements prior to transfer. Refer to the ASSIST articulation agreements at www.assist.org for approved lower-division courses offered at community colleges. Transfer credit for courses from four-year institutions or for community college courses not included in the ASSIST system is evaluated on a case-by-case basis; students must submit a Petition for Transfer Credit, Substitution, or Waiver and course syllabus to the HAVC Department for review.

A student may transfer up to three lower-division and two upper-division art history courses toward the major. HAVC majors must take a minimum of eight regularly scheduled HAVC courses from members of the HAVC faculty. Please keep in mind that the four lower-division courses required for the HAVC major must cover four different geographic regions.

Prospective students are also encouraged to complete the Intersegmental General Education Transfer Curriculum (IGETC) or to complete all UC Santa Cruz general education requirements before matriculation. Transfer students are strongly encouraged to contact the HAVC undergraduate advisor before enrolling at UCSC by emailing havc@ucsc.edu.

Getting Started at UCSC as a Transfer Student

Students seeking to declare the HAVC major must consult with the undergraduate advisor. Please email havc@ucsc.edu to make an appointment or visit during drop-in hours.

Letter Grade Policy

Only courses with grades of C or better can be used to fulfill major requirements. Courses in which students receive a grade of C-, D+, D, D- or F cannot be used to satisfy major requirements. Courses can be taken Pass/No Pass to satisfy major requirements. Please consult with your college academic advising office or the Office of the Registrar to determine limits on selecting the Pass/No Pass grading option.

[Optional Catchall]

Course Substitution Policy

For the major, a student may transfer up to three lower-division and up to two upper-division art history courses taken from other institutions. Students must submit a Petition for Transfer Credit, Substitution, or Waiver and course syllabus to the HAVC Department for review.

Double Majors and Major/Minor Combinations Policy

Study Abroad

The University of California's Education Abroad Program provides an excellent opportunity to take courses related to the history of art and visual culture in a range of locations. The department strongly encourages HAVC majors and minors to take advantage of this educational opportunity. Successfully completed EAP courses count as in-residence UC credit.

Upon return, you must submit a Petition for Transfer Credit, Substitution, or Waiver to substitute EAP courses for HAVC major requirements (EAP courses do not automatically satisfy major requirements). Petitions are evaluated on a case-by-case basis. We look for evidence that the course(s) provided critical analysis of the class material in its social and cultural context, as well as significant reading and writing requirements. We recommend you retain all relevant documentation (syllabi, reading lists, papers written, etc.) to support your case. We also suggest you consult with your HAVC advisor to plan your EAP courses in advance.

For additional information, visit the UC Education Abroad Program website.

Honors

Honors and Highest Honors in the Major

Honors and highest honors are awarded in the history of art and visual culture major to students who have shown a consistently outstanding level of performance throughout their coursework and maintained a superior GPA in the major. These distinctions are earned by only a small percentage of each graduating class. This notation appears on the transcript as well as on the diploma.

- Honors in the major are awarded to students with a GPA of 3.7 and above in all HAVC courses and with HAVC Department approval.*
- Highest honors in the major are awarded to students with a GPA of 3.9 and above in all HAVC courses and with HAVC Department approval.*

* Department approval is guided by consideration of criteria such as overall performance in HAVC coursework and the number of courses taken for a letter grade.

Honors in the Senior Comprehensive Requirement

All seniors must complete one HAVC seminar (courses in the 190-191 series) as their "senior exit" course to satisfy the senior comprehensive requirement. Seminars can be taken for senior

exit credit only by permission of the instructor. Within the context of this advanced seminar, students will work under the close supervision of their professor to produce a written project that demonstrates a high level of achievement in research, writing, and critical thinking. Students whose performance is outstanding are eligible for honors in the senior comprehensive requirement.

[Optional Catchall]

Careers

The preparation students receive from the bachelor of arts (B.A.) degree in HAVC can lead to successful careers in education, law, business, and social services, in addition to more disciplinary-specific careers in museum curating, art restoration, library and information science, heritage studies, design, criticism, arts education and administration, and advanced studies in architecture, visual culture, and art history.

General Major

Course Requirements

The HAVC major requires four lower-division and nine upper-division courses for a total of 13 courses, including the satisfactory completion of the senior comprehensive requirement. Students must take courses in each of the six different geographic regions listed below to ensure cultural, methodological, and disciplinary breadth.

For specific course offerings, please see the Course List by Geographic Region (p. 56).

For a current list of courses offered this academic year, please visit the HAVC website.

Lower-Division Courses

Take four courses from four different geographic regions listed below:

- HAVC courses 10-19: Africa and its Diaspora
- HAVC courses 20-29: Asia and its Diaspora
- HAVC courses 30-49: Europe and the Americas
- HAVC courses 50-59: Mediterranean
- HAVC courses 60-69: Native Americas
- HAVC courses 70-79: Oceania and its Diaspora

HAVC 80 may be used to fulfill a lower-division requirement for one of the following geographic regions: 10s (Africa), 60s (Native Americas), or 70s (Oceania).

Upper-Division Courses

Take the following course:

HAVC 100A Approaches to Visual Studies 5

Plus two upper-division geographic regional courses:

Take two upper-division geographic regional courses, one each from the two geographic regions not studied at the lower-division level. These are:

- HAVC courses 110-119: Africa and its Diaspora
- HAVC courses 120-129: Asia and its Diaspora
- HAVC courses 130-149: Europe and the Americas
- HAVC courses 150-159: Mediterranean
- HAVC courses 160-169: Native Americas
- HAVC courses 170-179: Oceania and its Diaspora

Plus five upper-division electives:

These are any HAVC courses numbered 110-191.

The department encourages students to take cross-regional and topical courses. These are HAVC courses numbered 180-189, which can fulfill upper-division major elective requirements but do not fulfill specific regional requirements.

Plus one senior exit seminar:

HAVC seminar courses are numbered 190-191. The senior exit seminar can be taken any quarter in which a student is in senior standing. Seminars can be taken for senior exit credit only by permission of the instructor.

Electives

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. Students in HAVC meet the DC requirement by completing:

HAVC 100A Approaches to Visual Studies 5

Comprehensive Requirement

All seniors must complete one HAVC seminar (courses in the 190-191 series) as their "senior exit" course to satisfy the senior comprehensive requirement. Seminars can be taken for senior exit credit only by permission of the instructor. Within the context of this advanced seminar, students will work under the close supervision of their professor to produce a written project that demonstrates a high level of achievement in research, writing, and critical thinking. Students whose performance is outstanding are eligible for honors in the senior comprehensive requirement.

Planners

Below are planners for freshmen and junior transfer students.

Please note that LD = lower-division and UD = upper-division.

Four-Year Freshman Planner

	Fall	Winter	Spring
Year	HAVC LD	HAVC LD	HAVC LD

1 (Fr)	regional requirement	regional requirement	regional requirement
Year 2 (So)	HAVC LD regional requirement	HAVC 100A	HAVC UD regional requirement
Year 3 (Jr)	HAVC UD regional requirement	HAVC UD (any region)	HAVC UD (any region)
Year 4 (Sr)	HAVC UD (any region) HAVC seminar	HAVC UD (any region)	HAVC UD (any region)

In addition to the specific courses shown in this four-year planner, students must complete all general education requirements, some of which may be satisfied by HAVC courses.

Two-Year Transfer Planner

	Fall	Winter	Spring
Year 1 (Jr)	HAVC LD regional requirement	HAVC 100A	HAVC LD regional requirement
	HAVC LD regional requirement	HAVC LD regional requirement	HAVC UD regional requirement
Year 2 (Sr)	HAVC UD regional requirement	HAVC UD (any region)	HAVC UD (any region)
	HAVC seminar	HAVC UD (any region)	HAVC UD (any region)

Concentration in Curation, Heritage, and Museums

This program is for HAVC majors who wish to pursue the study and practice of curation, heritage, and museums. Students will expand on the broad knowledge they gain through the major by means of a variety of historical, theoretical, and practical courses within the domains of curation, museum studies, and critical cultural heritage studies. Students can use the concentration as a launching point toward internships or jobs in

museums or cultural heritage institutions or to identify their interests for future graduate study.

Course Requirements

The HAVC major requires four lower-division and nine upper-division courses for a total of 13 courses, including the satisfactory completion of the senior comprehensive requirement. Students must take courses in each of the six different geographic regions listed below to ensure cultural, methodological, and disciplinary breadth.

For specific course offerings, please see the Course List by Geographic Region (p. 56).

For a current list of courses offered this academic year, please visit the HAVC website.

In fulfilling the major requirements, students in the concentration must successfully complete four courses from the “Approved Concentration Courses” list below. No more than one of the four courses can be lower-division and at least two of the four courses must be HAVC-sponsored courses. Concentration courses fulfill the elective requirement, and if appropriate, concentration courses can be used to fulfill the geographic regional requirement. Students can petition to apply courses that are not on the approved list. Approval of petitions will be determined by the amount of relevant course content and assignments.

Lower-Division Courses

Take four courses from four different geographic regions listed below:

- HAVC courses 10-19: Africa and its Diaspora
- HAVC courses 20-29: Asia and its Diaspora
- HAVC courses 30-49: Europe and the Americas
- HAVC courses 50-59: Mediterranean
- HAVC courses 60-69: Native Americas
- HAVC courses 70-79: Oceania and its Diaspora

HAVC 80 may be used to fulfill a lower-division requirement for one of the following geographic regions: 10s (Africa), 60s (Native Americas), or 70s (Oceania).

Upper-Division Courses

Take the following course:

HAVC 100A Approaches to Visual Studies 5

Plus two upper-division geographic regional courses:

Take two upper-division geographic regional courses, one each from the two geographic regions not studied at the lower-division level. These are:

- HAVC courses 110-119: Africa and its Diaspora
- HAVC courses 120-129: Asia and its Diaspora

- HAVC courses 130-149: Europe and the Americas
- HAVC courses 150-159: Mediterranean
- HAVC courses 160-169: Native Americas
- HAVC courses 170-179: Oceania and its Diaspora

Plus five upper-division electives:

These are any HAVC courses numbered 110-191. Students in the concentration should note that courses from the "Approved Concentration Courses" list below will most likely be taken in the process of completing the five upper-division electives.

The department encourages students to take cross-regional and topical courses. These are HAVC courses numbered 180-189, which can fulfill upper-division major elective requirements but do not fulfill specific regional requirements.

Plus one senior exit seminar:

HAVC seminar courses are numbered 190-191. The senior exit seminar can be taken any quarter in which a student is in senior standing. Seminars can be taken for senior exit credit only by permission of the instructor.

Electives

Approved Concentration Courses List

HAVC 40	Museum Cultures: The Politics of Display	5
HAVC 141I	Be Here Now: Art, Land, Space	5
HAVC 141M	Museum Practices	5
HAVC 141N	Data Cultures: Art, Technology, and the Politics of Visual Representation	5
HAVC 142M	Museum Exhibitions	5
HAVC 143A	Contemporary Architecture and Critical Debates	5
HAVC 178	Museums and Cultural Heritage in Oceania	5
HAVC 185	Art and Community: Arts Professions and Community Engagement	5
HAVC 188A	Introduction to Curatorial Studies	5
HAVC 188B	Biennials and Mega-Exhibitions	5
HAVC 188C	Site-Specific Art, Installations, Artists and Institutional Practice	5
HAVC 188M	Heritage, Memory, and Material Culture	5
ANTH 187	Cultural Heritage in Colonial Contexts	5
ANTH 187B	Cultural Resource Management	5
ANTH 196J	Imagining America	5
HIS 104D	Museums and the Representation of Native American History, Memory, and Culture	5

JWST 185N	The Holocaust in a Digital World	5
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Students may petition for HAVC 199 or HIS 199 to count for a concentration course under certain circumstances. Students should consult the HAVC undergraduate advisor prior to enrolling.

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. Students in HAVC meet the DC requirement by completing:

HAVC 100A	Approaches to Visual Studies	5
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Comprehensive Requirement

All seniors must complete one HAVC seminar (courses in the 190-191 series) as their "senior exit" course to satisfy the senior comprehensive requirement. Seminars can be taken for senior exit credit only by permission of the instructor. Within the context of this advanced seminar, students will work under the close supervision of their professor to produce a written project that demonstrates a high level of achievement in research, writing, and critical thinking. Students whose performance is outstanding are eligible for honors in the senior comprehensive requirement.

Planners

Below are planners for freshmen and junior transfer students.

Please note that LD = lower-division and UD = upper-division.

Four-Year Freshman Planner

	Fall	Winter	Spring
Year 1 (Fr)	HAVC LD regional requirement	HAVC LD regional requirement	HAVC LD regional requirement
Year 2 (Soph)	HAVC LD regional requirement	HAVC 100A	HAVC UD CHM course
Year 3 (Jr)	HAVC UD regional requirement	HAVC UD regional requirement	HAVC UD CHM course
Year 4 (Sr)	HAVC UD CHM course	HAVC UD CHM course	HAVC UD (any region)

HAVC
seminar

In addition to the specific courses shown in this four-year planner, students must complete all general education requirements, some of which may be satisfied by HAVC courses.

Two-Year Transfer Planner

	Fall	Winter	Spring
Year 1 (Jr)	HAVC LD regional requirement	HAVC 100A	HAVC LD regional requirement
	HAVC LD regional requirement	HAVC LD regional requirement	HAVC UD regional requirement HAVC UD CHM course
Year 2 (Sr)	HAVC UD regional requirement	HAVC UD CHM course	HAVC UD CHM course
	HAVC UD CHM course	HAVC UD (any region)	HAVC seminar

HISTORY OF ART AND VISUAL CULTURE MINOR

The history of art and visual culture (HAVC) minor works well when combined with other programs offered at UC Santa Cruz. Many students choose to combine HAVC with other major/minor programs such as anthropology, art, business management economics, classical studies, education, history, legal studies, literature, politics, psychology, and sociology.

For the minor, a student may transfer up to three lower-division art history courses (from three different geographic regions) taken from other institutions. HAVC minors must take a minimum of six regularly scheduled HAVC courses from members of the HAVC faculty. Refer to the articulation agreements at www.assist.org for approved lower-division courses offered at community colleges. Transfer credit for courses from four-year institutions or community college courses not included in the ASSIST system is evaluated on a case-by-case basis; students must submit a Petition for Transfer Credit, Substitution, or Waiver and course syllabus to the HAVC Department for review.

Course Requirements

The HAVC minor requires three lower-division and six upper-division courses for a total of nine courses.

For specific course offerings, please see the Course List by Geographic Region (p. 56).

For a current list of courses offered this academic year, please visit the HAVC website.

Lower-Division Courses

Three courses from three different geographic regions listed below:

- HAVC courses 10-19: Africa and its Diaspora
- HAVC courses 20-29: Asia and its Diaspora
- HAVC courses 30-49: Europe and the Americas
- HAVC courses 50-59: Mediterranean
- HAVC courses 60-69: Native Americas
- HAVC courses 70-79: Oceania and its Diaspora

HAVC 80 may be used to fulfill a lower-division requirement for one of the following geographic regions: 10s (Africa), 60s (Native Americas), or 70s (Oceania).

Upper-Division Courses

Six courses planned in consultation with the undergraduate adviser. These are HAVC courses numbered 110-191.

VISUAL STUDIES PH.D.

Introduction

The History of Art and Visual Culture Department offers a course of study leading to the Ph.D. in visual studies. Visual studies is an interdisciplinary program focused on visual-cultural scholarship, comprising specialized coursework and individual dissertation research in close coordination with faculty supervision. The expansive expertise of our diverse faculty addresses, and offers a broad scope of supervisory possibilities in researching, a variety of art forms and visual cultures with historical and contemporary perspectives and with global reach, including such regions as Sub-Saharan Africa, the Middle East, North America, Latin America, the Indigenous Americas (including pre-colonial California), Asia, Europe, the Mediterranean, and the Pacific Islands.

Our program provides students with unparalleled opportunities to consider the role of social, political, and cultural forces in both shaping and being shaped by assorted modes of visual experience and their relations as well to complex workings of multisensory perception. Areas of particular concern, both historical and current, include spatial and visual theories, environmental, social, and racial justice, colonial and decolonial visual culture, Anthropocene and Indigenous studies.

Our graduates consider a range of theoretical approaches and significant methodologies for the study of visuality, including object-centered, ecocritical, de- and post-colonial, new materialist, and social-historical (feminist, antiracist, Indigenous, and Marxist) varieties. Students explore diverse

cultural perspectives across time and space, and cultivate the necessary skills, knowledge, and expertise—including those of archival analysis, site-specific research, live interview and digital humanities techniques—in order to excel in academic, curatorial, publishing, and other related professional careers.

Focusing on a wide range of visual culture, our program is unconstrained by traditional mediums of art or conventional canons of art history. The capacious array of subjects examined in our courses and in the research of our faculty and students are as diverse as landscapes, ritual, performance, material culture, bodily adornment, popular entertainment, digital art and cybernetic data, photography, film, advertising, and design, as well as painting, sculpture, and architecture. Our Ph.D. program is particularly strong in comparative studies with historical and geographical expansiveness, examining significant differences in how disparate cultural groups engage, shape, and interpret their visual worlds.

Advancement to Candidacy

Course Requirements

Students take a minimum of 60 credits during their first two years of study, comprised of three core courses and nine electives.

Take the following three core courses:

HAVC 201A	Introduction to Visual Studies and Critical Theory	5
HAVC 202	Introduction to Visual Studies Methods	5
HAVC 204	Grant Writing	5

HAVC 201A: fall of the first year

HAVC 202: winter of the first year

HAVC 204: second year

Take nine electives:

Of the nine elective courses, at least five must have a visual studies designation (i.e., taught by core or affiliated faculty), and at least three must be drawn from departments outside of visual studies. Among the five visual studies electives, at least three must be from the HAVC courses numbered 212-282 and taught by core faculty, and at least one of the three must be a seminar course on a subject outside the student's disciplinary focus. Only two of the five visual studies electives may be independent study courses. Please review the visual studies website for a list of electives offered in the current year.

Field Clusters/Field Specialties

Appreciating that most of our graduates will be required to fit themselves back into traditional disciplinary structures once they enter the academic job market, the program is designed to provide students with both new means of interpreting visual evidence and suitable depth of understanding in older disciplinary traditions. While all graduates will acquire a shared foundation in different approaches to visuality (attained through our core course requirements), individual student programs vary considerably depending on the type of department or other

intellectual and professional context in which the student hopes to secure employment after graduation. In addition to completion of the core courses required of all students, students will develop a cluster of individualized field courses in consultation with their advisor based on their particular professional goals.

To provide our students with the disciplinary background to facilitate employment within curatorial departments in museums and non-visual studies departments at colleges and universities, each student is required to take a minimum of four 5-credit courses in a disciplinary cluster (beyond the core course requirements). This requirement pertains both to students entering with a B.A. and an M.A. Acceptable field cluster courses might center on a medium (i.e., painting or architecture), a temporal/stylistic category (i.e., Early Modern or Postmodernism), a cultural, national, or social group (i.e., Pacific Islanders or China), or a disciplinary approach (i.e., cultural anthropology or gender studies). Field clusters are developed in consultation with the student's advisor based on the student's intellectual and professional goals. To count toward the degree, field clusters must receive prior approval from the director of graduate studies.

Foreign Language Requirements

Students must demonstrate reading knowledge of one foreign language prior to the start of their second year (either by attaining a score of 550 or higher on the Educational Testing Service Graduate Student Foreign Language Test or by passing a reading/translation examination administered by the department).

Students are encouraged to master a second foreign language. Based on a student's area of interest, and the joint assessment of the student's advisor and the director of graduate studies, proof of proficiency in an additional language or languages may be required prior to the student being admitted to candidacy for the Ph.D. Should proficiency in additional languages be required, it must be demonstrated prior to the close of the student's third year of study.

Teaching Requirement

Pre-Qualifying Requirements

Qualifying Examination

After completing all coursework and passing one language examination, students are required to pass a qualifying examination prior to the close of the winter quarter of their third year, unless a petition for an extension, demonstrating reasonable cause, is approved by the visual studies director of graduate studies. The qualifying examination is divided into three topic areas, with each one including a written and an oral component. Each topic area should display historical breadth and variety of media. Two of the topic areas should ideally relate to the future dissertation topic, while one of the remaining must constitute an outside area, examining a topic that is chronologically, geographically, and/or methodologically distinct from the other two.

During their second year, a student should consult with their advisor to assemble a group of four faculty members who will serve as examiners and aid the student in assembling the necessary topic areas, compiling the needed reading lists, and preparing for the written and oral components of the examination in each area. The examination will have two parts. In part one, students will respond in writing to three general questions, posed by three of their examiners in the pre-arranged topic areas. In part two, students will gather together with their examiners to field questions probing and clarifying the previously submitted written component of the qualifying examination. In order to pass the qualifying examinations, students must receive the unanimous endorsement of the committee members.

Post-Qualifying Requirements

Dissertation Prospectus and Colloquium

After passing the qualifying examination, a student must complete an approved dissertation prospectus and a colloquium. The written dissertation prospectus is due no later than the end of the second quarter following the student's completion of the qualifying examination. The prospectus is a brief, concise essay of approximately 25 pages (with bibliography) that defines the scope, methodology, and rationale for the proposed dissertation. It is prepared in consultation with the student's dissertation advisor, who must approve of the document prior to sending it to the colloquium committee. The prospectus must be sent to the colloquium committee at least one month before the colloquium.

The dissertation advisor, in consultation with the student and director of graduate studies, will invite four to five faculty members, in appropriate fields, to be on the colloquium committee, attend the colloquium, provide input on the prospectus, and assess the student's preparedness to begin researching and writing the dissertation. Faculty participating in the colloquium may or may not have been members of the qualifying examination committee, and should represent faculty whose expertise has bearing on the student's project. A student will pass the colloquium after having demonstrated to the satisfaction of all colloquium committee members adequate preparation to begin researching and writing the dissertation.

Advancement to Candidacy

Advancement to candidacy follows and is contingent upon passing the qualifying examination, all needed language examinations, completing an approved dissertation prospectus, passing the colloquium, and the subsequent appointment of a dissertation reading committee of at least three members. The requirements for advancement to candidacy must be completed no later than the end of the winter quarter of the fourth year.

[Optional Catchall]

Dissertation

Dissertation

The dissertation must make a significant and original contribution to the field of visual studies, as judged by each dissertation committee member.

Dissertation Defense

An oral defense of the dissertation is the only final examination requirement, unless a petition to waive the oral defense, demonstrating reasonable cause, is approved by the student's primary advisor and the visual studies director of graduate studies. The student's dissertation committee, under the direction of an exam moderator, will conduct the examination. The moderator is selected in consultation with the faculty advisor and must be a visual studies core or affiliated tenured faculty who is not part of the dissertation reading committee.

Academic Progress

Applying for Graduation

Normative Time from Matriculation to Degree

The visual studies Ph.D. program at UCSC is designed to require six years of study. During the pre-candidacy period students will devote themselves to coursework, completion of the language examination, some teaching, preparation for and completion of qualifying examinations, completion of an approved version of their prospectus, passing their colloquium and selecting their dissertation committee. Requirements for advancing to candidacy must be completed by the end of winter quarter of the fourth year. Students will finish their dissertation and successfully defend it before the end of their sixth year.

[Optional Catchall]

VISUAL STUDIES DESIGNATED EMPHASIS

Introduction

UC Santa Cruz graduate students enrolled in doctoral programs may obtain a designated emphasis in visual studies as part of their Ph.D. degree.

Requirements

Graduate students enrolled in doctoral programs at UC Santa Cruz may obtain a Designated Emphasis in visual studies on their Ph.D. degree by meeting the following requirements:

Committee Composition and Departmental Approvals

Secure approval from a core member of the visual studies faculty to serve as an adviser for their designated emphasis.

Have at least one core member of the visual studies faculty serve on either their qualifying examination or dissertation committee.

Course Requirements

Successfully complete four graduate courses taught by either core or affiliated members of the Visual Studies program. The courses must form a coherent cluster in visual studies and be pre-approved by the student's designated emphasis adviser.

Writing, Research and/or Teaching Requirements

Submit a significant piece of writing that demonstrates competency in the field. The writing could take the form of a seminar paper or dissertation chapter. The essay must meet the approval of the student's visual studies adviser.

[Optional Catchall]**HISTORY OF ART AND VISUAL CULTURE COURSES BY GEOGRAPHIC REGION****Course List by Geographic Region**

The courses listed herein fulfill geographic regional requirements for the history of art and visual culture (HAVC) major and minor. Please see the 'Courses' section of the general catalog for a full list of HAVC course offerings.

Note: Not all of these courses are offered each academic year.

Lower-Division Courses**HAVC 10 - HAVC 19: Africa and its Diaspora**

HAVC 10	Introduction to African Visual Culture	5
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HAVC 20 - HAVC 29: Asia and its Diaspora

HAVC 20	Visual Cultures of Asia	5
HAVC 22	Religion and Visual Culture in China	5
HAVC 24	Southeast Asia Visual Culture	5
HAVC 27	Image and Ideology in Indian Art	5

HAVC 30 - HAVC 49: Europe and the Americas

HAVC 30	Introduction to European Visual Culture	5
HAVC 40	Museum Cultures: The Politics of Display	5
HAVC 41	Introduction to Modern Art	5
HAVC 43	History of Modern Architecture	5
HAVC 44	Designing California: Architecture, Design, and Environment	5
HAVC 45	Photography Now	5
HAVC 46	Introduction to U.S. Art and Visual Culture	5
HAVC 47	Introduction To Contemporary Art	5
HAVC 48	Climate Justice Now! Art, Activism, Environment Today	5
HAVC 49	From Memes to Metadata: an Introduction to Digital Visual Culture	5

HAVC 50 - HAVC 59: Mediterranean

HAVC 50	Ancient Mediterranean Visual Cultures	5
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HAVC 51	Greek Eyes: Visual Culture and Power in the Ancient Greek World	5
HAVC 55	Unclothed: The Naked Body from Antiquity to the Present	5
HAVC 58	Gardens of Delight: Fifteen Centuries of Islamic Visual Culture	5

HAVC 60 - HAVC 69: Native Americas

HAVC 60	Indigenous American Visual Culture	5
HAVC 64	Indigenous North American Materiality and Resistance	5

HAVC 70 - HAVC 79: Oceania and its Diaspora

HAVC 70	Visual Cultures of the Pacific Islands	5
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HAVC 80 may be used to fulfill a lower-division requirement for one of the following geographic regions: 10s (Africa), 60s (Native Americas), or 70s (Oceania).

Upper-Division Courses**HAVC 110 - HAVC 119: Africa and its Diaspora**

HAVC 110	Visual Cultures of West Africa	5
HAVC 111	Visual Cultures of Central Africa	5
HAVC 115	Gender in African Visual Culture	5
HAVC 116	African Architecture	5
HAVC 117	Contemporary Art of Africa	5
HAVC 118	Art of the Contemporary African Diaspora	5
HAVC 119	Arts and Politics of African Urban Space	5

HAVC 120 - HAVC 129: Asia and its Diaspora

HAVC 122A	Sacred Geography of China	5
HAVC 122B	Constructing Lives in China: Biographies and Portraits	5
HAVC 122C	Writing in China	5
HAVC 122D	Chinese Landscape Painting	5
HAVC 122F	Bodies in Chinese Culture	5
HAVC 123A	Modernity and the Arts of India	5
HAVC 123B	Religions and Visual Culture of South Asia	5
HAVC 124A	Arts of Ancient Southeast Asia	5
HAVC 124B	History of Photography in Southeast Asia	5
HAVC 124C	Arts and Politics in Theravada Traditions	5
HAVC 124D	Contemporary Art of Southeast Asia and its Diaspora	5

HAVC 124E	Southeast Asian-American and Diasporic Visual Culture	5	HAVC 141O	Sex, Lies, and Surveillance: Contemporary Documentary Arts	5
HAVC 127A	Buddhist Visual Worlds	5	HAVC 141P	Networks and Natures: Art, Technology, and the Nonhuman	5
HAVC 127B	Buddhist Pure Lands	5	HAVC 142	Contemporary Art and Ecology	5
HAVC 127C	Ritual in Asian Religious Art	5	HAVC 142M	Museum Exhibitions	5
HAVC 127D	Storytelling in Asian Art	5	HAVC 143A	Contemporary Architecture and Critical Debates	5
HAVC 127E	Modern/Contemporary Architecture of the Asia Pacific	5	HAVC 143B	History of Urban Design	5
HAVC 127F	The Politics of Exclusion: Asian American Visual Culture	5	HAVC 143C	Latin American Modern Architecture	5
HAVC 130 - HAVC 149: Europe and the Americas			HAVC 143D	Architecture and the City in Modern and Contemporary Visual Culture	5
HAVC 133A	Themes in the Study of Medieval Visual Culture	5	HAVC 143E	History of Design: The Objects of Technology, 1850-The Present	5
HAVC 135B	German Art, 1905-1945	5	HAVC 143F	Memory, Place, and Preservation in Modern Architecture	5
HAVC 135D	French Painting, 1780-1855	5	HAVC 143G	After Utopia: Architecture and the City, 1968-Present	5
HAVC 135E	Jewish Identity and Visual Representation	5	HAVC 144A	Latin American Art and Visual Culture	5
HAVC 135F	Art of the Book in Western Europe 500-1600	5	HAVC 150 - HAVC 159: Mediterranean		
HAVC 135G	Blood, Guts, and Gore: Representing War from Leonard da Vinci to Abu Ghraib	5	HAVC 151	Greek Myths Antiquity to the Present	5
HAVC 135H	Topics in European and Euro- American Visual Culture	5	HAVC 152	Roman Eyes: Visual Culture and Power in the Ancient Roman World	5
HAVC 135P	Paris, Capital of the 19th Century	5	HAVC 154	Byzantine Visual Culture: Politics and Religion in the Empire of Constantinople, 330-1453 A. C	5
HAVC 137A	Northern Renaissance Art	5	HAVC 155	Constructing Cleopatra: Power, Sexuality, and Femininity Across the Ages	5
HAVC 137E	Renaissance Prints	5	HAVC 157B	Italian Renaissance: Art and Architecture	5
HAVC 140A	America in Art	5	HAVC 157C	High Renaissance	5
HAVC 140B	Victorian America	5	HAVC 157D	Art of the Venetian Renaissance	5
HAVC 140C	Race and American Visual Arts	5	HAVC 160 - HAVC 169: Native Americas		
HAVC 140D	Chicano/Chicana Art: 1970- Present	5	HAVC 160A	Indigenous American Visual Culture Before 1550: Mexico	5
HAVC 140E	Art and Science in America: Contact to circa 1900	5	HAVC 160B	Indigenous American Visual Culture Before 1550: The Andes	5
HAVC 140P	Pop Culture as High Art	5	HAVC 162A	Advanced Studies in Early Indigenous American Visual Culture: The Ancient Maya	5
HAVC 141A	Modern Art: Realism to Cubism	5	HAVC 162B	Advanced Studies in Early Indigenous American Visual Culture: The Inka	5
HAVC 141B	Death, Desire, and Modernity	5	HAVC 163	The Native in Colonial Spanish America	5
HAVC 141C	Modern Art: Pop to Present	5	HAVC 164A	Art and Visual Culture of Indigenous California	5
HAVC 141E	Histories of Photography	5			
HAVC 141F	The Camera and the Body	5			
HAVC 141H	Media History and Theory	5			
HAVC 141I	Be Here Now: Art, Land, Space	5			
HAVC 141J	Critical Issues in Contemporary Art and Visual Culture	5			
HAVC 141K	Activist Art Since 1960: Art, Technology, Activism	5			
HAVC 141M	Museum Practices	5			
HAVC 141N	Data Cultures: Art, Technology, and the Politics of Visual Representation	5			

HAVC 165	Indigenous Artists and the Borderland Missions	5
HAVC 170 - HAVC 179: Oceania and its Diaspora		
HAVC 170	Art of the Body in Oceania	5
HAVC 172	Textile Traditions of Oceania	5
HAVC 178	Museums and Cultural Heritage in Oceania	5
HAVC 179	Topics in Oceanic Visual Culture	5

Music

244 Music Center
(831) 459-2292
music@ucsc.edu
<http://music.ucsc.edu>

PROGRAMS OFFERED

Music B.A. (p. 59)

Music B.M. (p. 70)

Western Art Music Minor (p. 70)

Electronic Music Minor (p. 76)

Jazz, Spontaneous Composition, and Improvisation Minor (p. 77)

Music M.A. (p. 78)

Music D.M.A. (p. 79)

Music Ph.D. (p. 81)

UNDERGRADUATE PROGRAM

The Music Department at UC Santa Cruz offers two undergraduate degrees: a Bachelor of Arts (B.A.) and a Bachelor of Music (B.M.). The B.A. degree offers a uniquely diverse curriculum, with the option of completing a concentration in either Contemporary Practices, Global Musics, or Western Art Music. The B.M. degree is designed for students who intend to pursue a career in music performance. The department also offers minors in “Electronic Music,” “Jazz, Spontaneous Composition and Improvisation,” and “Western Art Music,” providing more access for music students and students in other disciplines to engage with music during their studies at UC Santa Cruz. Both B.A. and B.M. degrees are distinctive in that they integrate elements of performance, theory, composition, literature, and history, and culture. Students leave UC Santa Cruz prepared for graduate studies and music careers in performance, teaching, and the digital arts.

Through these curricular offerings, students will encounter an extraordinarily rich variety of performance opportunities. Specifically, our students engage with music:

- as a cultural practice in ensembles focusing on musical traditions from Europe, Central Asia, Latin America, North America, South Africa, South Asia and Southeast Asia;

- temporally in ensembles based on Baroque, Classical and contemporary idioms to deepen their understanding of performance practices;

- technologically in electronic music ensembles and workshops where students experiment with innovative technologies to develop their own projects with the support of their advisors and peers.

- collaboratively in seminars geared toward student composition and improvisation.

Students at UC Santa Cruz have extraordinary performance, composition, and professionalization opportunities. All instrument and voice faculty are celebrated professional musicians, who provide unparalleled guidance for students in performance and professional development. Ensemble courses culminate in an end-of-quarter performance, providing students with regular performance opportunities in a world-class recital hall. Student composers frequently collaborate with Arts Division faculty and peers to create and showcase their works. The electronic music minor provides hands-on opportunities for students to learn a variety of techniques related to electronic sound production, composition and recording in a state-of-the-art studio facility. The Opera Program allows students to be involved in every step of a major production, from concept and design considerations to marketing and arts management. As performers, composers, artistic collaborators and event organizers, these programs allow students to develop musically and professionally for diverse career paths and industries.

Our programs shape responsible, independent, and highly capable young artists that will push the frontiers of their fields. Graduates from the Music Department at UC Santa Cruz are musically attuned and socially engaged global citizens in the 21st century.

COURSES FOR NON-MAJORS

All music courses are open to non-majors, with many fulfilling general education requirements while offering exploration in the field of music. Courses in the MUSC 11, MUSC 80, and MUSC 81 series cover a wide array of topics that may interest students. Non-majors are also able to enroll in all performing ensembles. Students should check out music.ucsc.edu for further information regarding preparation and auditions, and contact the Music Department if they have further questions.

GRADUATE PROGRAM

There are three graduate programs in music: the Master of Arts (M.A.) and Doctor of Philosophy (Ph.D.) degrees in music and the Doctor of Musical Arts (D.M.A.) degree in music composition. The M.A. degree in music has emphases in composition, musicology/ethnomusicology, or performance practice, and integrates studies in performance, composition/analysis, and research. The Ph.D. degree in music has an emphasis in cross-cultural studies, and aims to provide doctoral students with an integrative framework for music scholarship, emphasizing the ways in which musicology and ethnomusicology interact and complement one another. The D.M.A. degree in music composition allows doctoral students

to pursue various and intersecting areas of emphasis such as algorithmic/computer-assisted composition, world music composition, collaborative composition in music, and other contemporary practices to provide a broad awareness of the diverse styles, cultural influences, media, venues, and technical means available to them in the 21st century.

The Music Center includes a 400-seat recital hall that has recording facilities, specially equipped classrooms, individual practice and teaching studios, a student computer laboratory, rehearsal space for ensembles, a gamelan studio, and studios for electronic and computer music. McHenry Library has a separate music section and listening rooms that have individual audio and video facilities. Recording and media equipment is available from the Learning Technologies center.

MUSIC B.A.

Information and Policies

Introduction

The Music Department supports an unusually diverse curriculum for a department of its size. By a choice of concentrations within the bachelor of arts (B.A.) degree, the student can emphasize different aspects of music. The “Contemporary Practices” and “Global Musics” concentrations offer a variety of modules (groupings of courses with various focuses) that students will be required to select from in addition to core requirements designed specifically for each concentration. All students pursuing the B.A. degree must select one of the three concentrations.

The concentrations and corresponding modules relevant to each concentration are:

Contemporary Practices Concentration. A concentration emphasizing composition and improvisation across multiple genres of music composition. Modules offered are:

- Global Art Musics
- Spontaneous Composition and Improvisation
- Experimental & Contemporary Musics. This module offers a variety of electronic music studio courses.

All module offerings are based on availability within the curriculum plan. Students should visit the Music Department website for a list of when each module’s courses will be offered.

Global Musics Concentration. A concentration emphasizing global music research, performance, and writing. Modules offered are:

- Africa and the Americas
- Asia
- Contemporary/Experimental
- Jazz
- Popular Music

- World Music

All module offerings are based on availability within the curriculum plan. Students should visit the Music Department website for a list of when each module’s courses will be offered.

Western Art Music Concentration. A concentration emphasizing classical Western art music performance, theory and history. This concentration requires some performance ability on a standard orchestral instrument or voice in classical repertoire (or improvisational repertoire for drum set majors) upon entry to the concentration. This concentration does not have a set of modules, but rather has a set course list of requirements.

The list of course requirements and when the courses are offered can be found on the Music Department website.

Academic Advising for the Program

General information about the music degrees is available on the department website. Students are also strongly encouraged to consult early with the Music Department advisor to create an academic plan for the major or a minor far in advance of declaration, as early as the summer before beginning at the university.

Transfer students should consult the Transfer Information and Policy section.

Please contact the department advisor by emailing music@ucsc.edu or calling (831) 459-2292. Slug Success is also available to make an appointment.

Getting Started in the Major

It is essential that frosh students plan to take MUSC 30A, as well as begin participating in ensembles in the fall of their second year, or as early as possible, in order to make satisfactory progress toward their degree objectives.

The Theory Placement Exam is for placement of students, including transferring or re-entering students, into the appropriate music core course (MUSC 13, MUSC 14, MUSC 15, or MUSC 30A). It includes written sections in the areas of theory and musicianship that emphasize aural recognition and identification of musical structures (intervals, chords, rhythms, meters, etc.). Students may prepare for the exam by honing skills in reading both bass and treble clef and in recognizing melodic and harmonic structures, and complex rhythmic patterns.

Students with some theory background should plan to take the Theory Placement Exam to place into MUSC 13, MUSC 14 and MUSC 15, or MUSC 30A. Students without any theory background, or weak aural skills, should enroll in MUSC 13, or MUSC 14 and MUSC 15 in their first year in order to prepare for the placement exam. Admission to MUSC 30A is primarily based on the Theory Placement Exam scores, but students who get a final grade of “A” from the preparatory music theory classes (MUSC 14 and MUSC 15) are eligible to automatically place into MUSC 30A.

The Theory Placement Exam is held twice a year: on the Tuesday before instruction begins in fall quarter, from 10:00 a.m.-12:30 p.m., and at the beginning of spring quarter (schedule TBA), both in the Music Center Recital Hall. No signup is necessary. Students should bring a pencil. Students can visit the Music Department website to view the sample exam.

Program Learning Outcomes

The bachelor of arts program in music is designed to accomplish the following learning outcomes:

1. Attainment of knowledge and understanding of music in an integrated way, through historical and cultural studies, musicianship, theory, composition, and performance. These studies prepare students to pursue a career in some aspect of music, to further develop their skills in graduate study, and/or to maintain music as a central part of their lives.
2. Acquisition of musical competency, including literacy (the use of music notation in reading, performing, composing, analyzing, and hearing music).
3. Developing skills of critical thinking and writing about music by taking courses on past and present musical cultures in a variety of global heritages.
4. Creating music by performing, composing, and improvising.

Major Qualification Policy and Declaration Process

Major Qualification

In order to declare the music major, students must successfully complete MUSC 30A with a grade of "C" or better. A "Pass" grade is also acceptable since letter grades are not required for lower-division courses. Students in the Western Art Music concentration also need signature approval by the applied instrument instructor on the primary instrument authorization form.

Students approaching their major declaration deadline quarter (sixth quarter for four-year students, second quarter for transfer students), should reach out to the Music Department office as soon as possible to set up a declaration advising appointment.

Transfer students should also see the "Transfer Information and Policy" section below.

Appeal Process

Students who are informed that they are not eligible to declare the major may appeal this decision by submitting a letter to the department chair within 15 days from the date the notification was mailed.

The appeal process can be started by emailing the undergraduate advisor in the music office.

Within 15 days of receipt of the appeal, the department will notify the student and college of the decision.

How to Declare a Major

All students should meet with the academic advisor to begin the major declaration process either by making an appointment (via Slug Success), by email to music@ucsc.edu, or by stopping by the department office, Music Center, Room 244 or 248. Students are also required to meet with a faculty advisor (assigned with help from the academic advisor) as part of the declaration process.

Students should submit a petition to declare as soon as they complete the major qualification requirements or reach their declaration deadline quarter (whichever comes first). The declaration deadline for four-year students is their sixth quarter, and the second quarter for transfer students.

Students petitioning when the campus declaration deadline is imminent, will either be approved, denied, or provided with conditions (e.g. completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed major qualification courses.

Transfer Information and Policy

Transfer Admission Screening Policy

Students planning to apply to UC Santa Cruz in this major are not required to complete specific courses for consideration of admission to UCSC.

Transfer students are strongly recommended to take some music theory courses before transfer to UC Santa Cruz, which generally enables them to test into MUSC 30A. They should also have completed most general education requirements, although some GE requirements may be fulfilled by lower-division courses in the major.

Getting Started at UCSC as a Transfer Student

Transfer students should plan to take the Theory Placement Exam to place into MUSC 13, MUSC 14 and MUSC 15, or MUSC 30A. All transfer students should take the Theory Placement Exam fall of their first quarter. It is an option for transfer students to take the examination prior to applying to UC Santa Cruz as a practice guide for future preparation, or in the spring quarter before their first fall quarter. Students can also visit the Music Department website to view the sample examination.

Transfer students can also take MUSC 15 during Summer Session at UCSC prior to fall of their arrival. Taking MUSC 15 will help prepare students for the Theory Placement Exam and generally results in students placing into MUSC 30A. Admission to MUSC 30A is primarily based on the Theory Placement Exam scores, but students who get a final grade of "A" from the preparatory music theory classes (MUSC 14, and MUSC 15) are eligible to automatically place into MUSC 30A.

The Theory Placement Exam is held twice a year: on the Tuesday before instruction begins, from 10:00 a.m.-12:30 p.m. in the Music Center Recital Hall, and at the beginning of spring quarter (schedule TBA). No signup is necessary. Students should bring a pencil.

All transfer students are strongly encouraged to email music@ucsc.edu to schedule a phone-advising appointment with the undergraduate advisor prior to application.

Letter Grade Policy

All upper-division courses applied toward the music majors must be taken for a letter grade, except MUSC 120 (Composition) and ensembles, which may be taken Pass/No Pass.

Lower-division courses may be taken Pass/No Pass.

Course Substitution Policy

Students who have taken introductory or topical large lecture music courses at other institutions may email the curriculum committee to propose course substitutions. To begin this process, email music@ucsc.edu.

Double Majors and Major/Minor Combinations Policy

Double majors **are** possible for the music major. A student can double major with a Music Bachelor of Arts (B.A.) Degree or a Bachelor of Music (B.M.) Degree, and a major from another department. Students that plan to double major should meet with the music undergraduate advisor for course planning in fall quarter of their first year.

It is not possible to double major as a music B.A. and a music B.M. However, it is possible to pursue the B.M. and add the "Jazz, Spontaneous Composition and Improvisation Minor" or "Electronic Music minor." It is not possible to add the "Western Art Music Minor" to the Music B.A. or Music B.M. degrees.

Students are not able to add the "Western Art Music Minor" or "Jazz, Spontaneous Composition and Improvisation Minor" to the Music B.A. Contemporary Practices or Global Musics concentrations in the Music B.A., due to potential overlap between these curricula. Similarly, the "Electronic Music Minor" cannot be added to the Contemporary Practices concentration.

The "Jazz, Spontaneous Composition and Improvisation Minor" can be added to the Western Art Music concentration. The "Electronic Music Minor" can still be added to the Global Musics or Western Art Music concentration.

Study Abroad

The department encourages students to explore studying abroad while attending UC Santa Cruz. In particular, the UCSC Music Department has an exchange program agreement with the Music Department at the University of Sussex. University of Sussex offers many courses that can be substituted for music major or minor requirements.

For more information on approved course substitutions and the exchange program please visit the Study Abroad website.

Honors

Honors in the major are conferred by vote of the music faculty. B.A. or B.M. students can be awarded honors for excellent work in individual areas, including coursework and a capstone

course (research thesis or creative portfolio). Excellent work in any two of these areas normally results in honors in the major.

To be considered for highest honors in the major, B.A. students must also complete an additional senior project (not required for their concentration) and B.M. students must complete a capstone course (not required for the B.M. degree). Honors in all three areas—coursework, senior project, and capstone course—normally results in highest honors in the major.

How Music Majors Are Assessed

For students in the Western Art Music concentration:

1. Placement exams at the outset of studies assess students' musical competence, and determine their place in the required lower-division theory and harmony courses.
2. Admission to most performance ensembles is by audition. Assessment is based on successful public performances.
3. A juried "advisory audition" is required for students enrolled in MUSC 30A to give students feedback so that they can work toward meeting the requirements for the proficiency audition at the end of the next fall quarter.
4. A juried "proficiency audition" is required for students enrolled in MUSC 130. All students must exhibit an upper-intermediate or higher level on their major instrument or voice.
5. Students will always declare as a music B.A. If you are interested in becoming a music B.M. student, auditions for admission to the B.M. program are held at the end of each fall quarter. Students accepted to the program are required to audition twice a year for continuing review and critique. Students in the B.M. program present a senior recital which is evaluated by faculty. See the music B.M. page for more information.
6. In required and elective seminars, critical thinking and writing are assessed when students present a major independent project at the end of term.
7. Compositional skills are assessed through the rehearsal and public performance of student works.

For students in the Global Musics concentration:

1. Placement exams at the outset of studies assess students' musical competence, and determine their place in the required lower-division theory and harmony courses.
2. Admission to most performance ensembles is by audition. Assessment is based on successful public performances.
3. In required and elective seminars, critical thinking and writing are assessed when students present a major independent project at the end of term.
4. Compositional skills are assessed through the rehearsal and public performance of student works, when applicable.

For students in the Contemporary Practices concentration:

1. Placement exams at the outset of studies assess students' musical competence, and determine their place in the required lower-division theory and harmony courses.
2. Admission to most performance ensembles is by audition. Assessment is based on successful public performances.
3. Compositional skills are assessed through the rehearsal and public performance of student works, when applicable. Additionally, students will be expected to present a senior composition recital at the end of their residency.
4. In required and elective seminars, critical thinking and writing are assessed when students present a project or paper at the end of term.

[Optional Catchall]

Contemporary Practices Concentration

Course Requirements

In addition to the core course work and electives listed below, students pursuing the Contemporary Practices concentration are required to complete three modules, relating to cross-cultural themes and genres:

- Experimental & Contemporary Musics
- Global Art Musics
- Spontaneous Composition & Improvisation

The following course list outlines the general concentration requirements. See the list of approved courses relevant to each module.

Lower-Division Courses

MUSC 13 is designed for students with barely any or no music theory experience. MUSC 14 and MUSC 15 (the Summer Session version of MUSC 14) are meant for students with some music theory experience. Students can bypass these requirements by placing into MUSC 30A via the Theory Placement Exam. Students that don't place into MUSC 30A but place into MUSC 14 only need to **take one of** MUSC 14 or MUSC 15, not both. Students may also place directly into MUSC 30A by receiving a final grade of "A" or "A+" in MUSC 14/MUSC 15.

The Theory Placement Exam is offered twice per year: in fall quarter, the Tuesday before classes start; and in the beginning of spring quarter. See the Music Department website for exam details.

MUSC 14	Beginning Theory & Musicianship II	5
MUSC 16	Theoretical Foundations of Music	5
MUSC 30A	Theory, Literature, and Musicianship	5

MUSC 30B	Theory, Literature, and Musicianship	5
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Upper-Division Courses

Students must take two quarters of MUSC 120, both with different instructors.

MUSC 101C	History of Western Art Music	5
MUSC 120	Seminar in Music Composition	5
MUSC 121	Orchestration	5

Modular Requirements

Each module consists of:

- a lower-division MUSC 11, MUSC 80, or MUSC 81-series course specific to each module (three total)
- an upper-division MUSC 150 or equivalent (theory/composition-based) course specific to each module (three total)
- two quarters of performing ensembles or performance practice workshops specific to each module (six total)

See the list of approved courses (p. 84) relevant to each module.

Electives

Take one course from the MUSC 150 series, or equivalent (theory/composition-based), plus another course from any of the ones listed below (two quarters total).

Courses **may not** be repeated for credit, or be double-counted with courses applied toward modular requirements.

Students may also elect to take a graduate-level seminar in place of their final elective. All graduate courses require instructor and/or department permission to add.

MUSC 101A	History of Western Art Music (Medieval, Renaissance, and Baroque)	5
MUSC 101B	History of Western Art Music	5
MUSC 105A	Music of the United States	5
MUSC 105C	Folk and Traditional Music in California	5
MUSC 105E	Early Keyboard Music	5
MUSC 105I	Improvisation and Collaborative Practices in the 20th Century	5
MUSC 105M	Solo Song: from Monophony to Monody	5
MUSC 105O	Opera from Peri to Pergolesi	5
MUSC 105P	The Piano	5
MUSC 105Q	The String Quartet from Haydn to the Present	5
MUSC 105R	History of Russian Music	5
MUSC 111B	Seminar in Jazz Analysis	5
MUSC 123	Electronic Sound Synthesis	5
MUSC 124	Intermediate Electronic Sound Synthesis	5
MUSC 125	Advanced Electronic Sound Synthesis	5

MUSC 130	Harmony and Form in 19th-Century and Early 20th-Century Music	5	MUSC 75	Jazz Theory I	5
MUSC 150A	Music Analysis for Performers	5	MUSC 80Z	Laptop Music	5
MUSC 150C	Special Topics in Music Theory: Tonal Counterpoint	5	MUSC 102	University Orchestra	2
MUSC 150I	Special Topics in Music Theory: Hindustani Music	5	MUSC 103	University Concert Choir	2
MUSC 150P	Special Topics in Music Theory: 20th-Century Popular Song	5	MUSC 129	Live Electroacoustic Music Ensemble	2
MUSC 150R	Field Recording: Mapping and Composing Sound, Identity, and Place	5	MUSC 158	South African Music Ensemble	2
MUSC 150S	Focus on Spontaneous Composition	5	MUSC 163	Early Music Ensemble	2
MUSC 150T	Post Tonal Analysis	5	MUSC 164	Jazz Ensembles	2
MUSC 150X	Theoretical Practices of American Music	5	MUSC 165	Chamber Music Workshop	2
MUSC 174	Intermediate Spontaneous Composition and Improvisation	5	MUSC 166	Chamber Singers	2
MUSC 175	Jazz Theory II	5	MUSC 167	Workshop in Electronic Music	2
MUSC 180A	Studies in World Musics: Asia and the Pacific	5	MUSC 167R	Recording Workshop	2
MUSC 180B	Studies in World Musics: Africa and the Americas	5	MUSC 168	Experimental Music Ensemble	2
MUSC 180C	Studies in World Musics: Central Asia	5			
MUSC 203B	Performance Practice in the Renaissance	5			

Elective Ensembles

Take three quarters of any of the following courses. All courses except MUSC 74, MUSC 75, MUSC 80Z, and MUSC 167R may be repeated for credit.

Students **may not** double-count these ensembles with ensembles taken toward the modular requirements.

MUSC 1C	University Concert Choir	2
MUSC 2	University Orchestra	2
MUSC 3	Large Jazz Ensemble	2
MUSC 5A	West Javanese Gamelan Ensemble: Beginning	2
MUSC 5B	West Javanese Gamelan Ensemble: Intermediate	2
MUSC 5C	West Javanese Gamelan Ensemble: Advanced	2
MUSC 8A	Beginning Balinese Gamelan	2
MUSC 8B	Advanced Balinese Gamelan	2
MUSC 9	Wind Ensemble	2
MUSC 10	Central Asian Ensemble	2
MUSC 12	Mariachi Ensemble	2
MUSC 12B	Mexican Folklorico Music and Dance	2
MUSC 54	North Indian Music Workshop	2
MUSC 55	Rhythms of North India	2
MUSC 55A	Intermediate Rhythms of North India	2
MUSC 74	Spontaneous Composition/Improvisation I	5

Disciplinary Communications (DC) Requirement

Students of every major must satisfy that major's upper-division disciplinary communication (DC) requirement. The DC requirement for the music B.A. degree is satisfied by completing two courses.

Students in the Contemporary Practices concentration are required to take MUSC 101C as part of the concentration's core requirements, which fulfills one half of the D.C. requirement. The second half of the D.C. requirement can be fulfilled by taking one of the following courses as your upper-division elective, or as the upper-division component to one of your chosen modules. If taken toward a module, the course can count as both a modular course and D.C. course.

MUSC 101A	History of Western Art Music (Medieval, Renaissance, and Baroque)	5
MUSC 101B	History of Western Art Music	5
MUSC 105A	Music of the United States	5
MUSC 105C	Folk and Traditional Music in California	5
MUSC 105M	Solo Song: from Monophony to Monody	5
MUSC 105Q	The String Quartet from Haydn to the Present	5

Comprehensive Requirement

For their Senior Capstone project, students in the Contemporary Practices concentration must present a senior composition recital or portfolio.

Students should consult their faculty advisor (chosen when you declare the major) and department advisor when planning their recital/portfolio.

MUSC 196A	Senior Recital Preparation (without individual lessons)	5
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Planners

In addition to core curriculum requirements for the Contemporary Practices Concentration, students must also complete three modules. Each module will consist of:

- a lower-division MUSC 11, MUSC 80, or MUSC 81-series course specific to each module (three total);

- an upper-division MUSC 150 or equivalent (theory/composition-based) course specific to each module (three total);
- two quarters of performing ensembles or performance practice workshops specific to each module (six total).

Please see sample two and four-year plans below.

Four-Year Plan for Incoming Frosh

Year	Fall	Winter	Spring
1st (frosh)	MUSC 16 (if necessary) Module: Lower-div 1	MUSC 14 (if necessary) Module: Lower-div 2	Module: Lower-div 3
2nd (soph)	MUSC 30A Module: Ensemble 1	MUSC 30B Module: Ensemble 1	Module: Upper-div 1 Elective ensemble
3rd (jr)	MUSC 121 MUSC 101C (D.C.) Module: Ensemble 2	MUSC 120 Elective upper-div (D.C.) Module: Ensemble 2	Module: Upper-div 2 Module: Ensemble 3
4th (sr)	Elective upper-div (150) Module: Ensemble 3	MUSC 120 Module: Upper-div 3 Elective ensemble	MUSC 196A Elective ensemble

Two-Year Plan for Transfer Students

Year	Fall	Winter	Spring
1st (jr)	MUSC 16 (if necessary) MUSC 30A Module: Lower-div 1 Module: Ensemble 1	MUSC 30B Module: Lower-div 2 Elective: Upper-div (D.C.) Module: Ensemble 1	Module: Lower-div 3 Module: Upper-div 1 Module: Ensemble 2
2nd	MUSC 121	MUSC 120	MUSC 120

(sr)	MUSC 101C (D.C.) Module: Upper-div 3 Module: Ensemble 2 Elective ensemble	Module: Upper-div 2 Elective: Upper-div (150) Module: Ensemble 3 Elective ensemble	MUSC 196A Module: Ensemble 3 Elective ensemble
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General Education (GE) Codes

MUSC 11, MUSC 80, and MUSC 81 series courses will fulfill a variety of GE requirements including: IM, CC, ER, MF, PE-E, PE-H, PE-T, and PR-C.

MUSC 150C, MUSC 150P, MUSC 150T, MUSC 150X fulfill the IM GE requirement. MUSC 150I fulfills the CC GE.

Most, but not all, ensembles satisfy the PR-C or PR-E code GE requirement. Students should check to confirm which courses from the ensembles course list satisfy GE codes.

Students must complete all other general education requirements.

Transfer Student Progress

Some courses from the MUSC 11, MUSC 80, and MUSC 81 series, along with some performing ensembles, can be articulated from courses taken at other institutions. Please email music@ucsc.edu with any questions about course articulations/substitutions.

Global Musics Concentration

Course Requirements

In addition to the core course work and electives listed below, students pursuing the Global Musics concentration are required to complete three modules, relating to geographical areas, themes, and genres:

- Africa & the Americas
- Asia
- Contemporary/Experimental Music
- Europe
- Jazz
- Popular Music
- World Musics

The following course list outlines the general concentration requirements. See the list of approved courses relevant to each module.

Lower-Division Courses

MUSC 13 is designed for students with barely any or no music theory experience. MUSC 14 and MUSC 15 (the Summer Session version of MUSC 14) are meant for students with some music theory experience. Students can bypass these requirements by placing into MUSC 30A via the Theory Placement Exam. Students that do not place into MUSC 30A but place into MUSC 14 only need to **take one of** MUSC 14 or MUSC 15, not both. Students may also place directly into MUSC 30A by receiving a final grade of "A" or "A+" in MUSC 14/MUSC 15.

The Theory Placement Exam is offered twice per year: in fall quarter, the Tuesday before classes start; and in the beginning of spring quarter. See the Music Department website for exam details.

MUSC 14	Beginning Theory & Musicianship II	5
MUSC 16	Theoretical Foundations of Music	5
MUSC 30A	Theory, Literature, and Musicianship	5

Modular Requirements

Each module consists of:

- a lower-division MUSC 11, MUSC 80, or MUSC 81-series course specific to each module (three total)
- an upper-division MUSC 101, MUSC 105, MUSC 150, or MUSC 180 course specific to each module (three total)
- two quarters of performing ensemble or performance practice workshop specific to each module (six total)

See the list of approved courses (p. 85) relevant to each module.

Electives

Take three elective courses from the upper-division music catalog. These courses **cannot** double count with modular electives.

Take three of the following courses

MUSC 101A	History of Western Art Music (Medieval, Renaissance, and Baroque)	5
MUSC 101B	History of Western Art Music	5
MUSC 101C	History of Western Art Music	5
MUSC 105A	Music of the United States	5
MUSC 105C	Folk and Traditional Music in California	5
MUSC 105E	Early Keyboard Music	5
MUSC 105I	Improvisation and Collaborative Practices in the 20th Century	5
MUSC 105M	Solo Song: from Monophony to Monody	5
MUSC 105O	Opera from Peri to Pergolesi	5
MUSC 105P	The Piano	5

MUSC 105Q	The String Quartet from Haydn to the Present	5
MUSC 105R	History of Russian Music	5
MUSC 111B	Seminar in Jazz Analysis	5
MUSC 120	Seminar in Music Composition	5
MUSC 121	Orchestration	5
MUSC 122	Conducting	2
MUSC 130	Harmony and Form in 19th-Century and Early 20th-Century Music	5
MUSC 150A	Music Analysis for Performers	5
MUSC 150C	Special Topics in Music Theory: Tonal Counterpoint	5
MUSC 150I	Special Topics in Music Theory: Hindustani Music	5
MUSC 150P	Special Topics in Music Theory: 20th-Century Popular Song	5
MUSC 150S	Focus on Spontaneous Composition	5
MUSC 150T	Post Tonal Analysis	5
MUSC 150X	Theoretical Practices of American Music	5
MUSC 175	Jazz Theory II	5
MUSC 180A	Studies in World Musics: Asia and the Pacific	5
MUSC 180B	Studies in World Musics: Africa and the Americas	5
MUSC 180C	Studies in World Musics: Central Asia	5
MUSC 180D	Music of Insular Southeast Asia	5

Elective Ensembles

Take three courses from the following list, from any area (these courses **cannot** double count with ensembles taken toward modular requirements). Courses can be repeated.

MUSC 1C	University Concert Choir	2
MUSC 2	University Orchestra	2
MUSC 3	Large Jazz Ensemble	2
MUSC 5A	West Javanese Gamelan Ensemble: Beginning	2
MUSC 5B	West Javanese Gamelan Ensemble: Intermediate	2
MUSC 5C	West Javanese Gamelan Ensemble: Advanced	2
MUSC 8A	Beginning Balinese Gamelan	2
MUSC 8B	Advanced Balinese Gamelan	2
MUSC 9	Wind Ensemble	2
MUSC 10	Central Asian Ensemble	2
MUSC 12	Mariachi Ensemble	2
MUSC 12B	Mexican Folklorico Music and Dance	2
MUSC 54	North Indian Music Workshop	2
MUSC 55	Rhythms of North India	2
MUSC 55A	Intermediate Rhythms of North India	2
MUSC 74	Spontaneous Composition/Improvisation I	5
MUSC 80Z	Laptop Music	5

MUSC 102	University Orchestra	2	MUSC 105M	Solo Song: from Monophony to Monody	5
MUSC 103	University Concert Choir	2	MUSC 105Q	The String Quartet from Haydn to the Present	5
MUSC 129	Live Electroacoustic Music Ensemble	2			
MUSC 158	South African Music Ensemble	2			
MUSC 163	Early Music Ensemble	2			
MUSC 164	Jazz Ensembles	2			
MUSC 165	Chamber Music Workshop	2			
MUSC 166	Chamber Singers	2			
MUSC 167	Workshop in Electronic Music	2			
MUSC 167R	Recording Workshop	2			
MUSC 168	Experimental Music Ensemble	2			
MUSC 174	Intermediate Spontaneous Composition and Improvisation	5			
MUSC 203H	Area Studies in Performance Practice	5			
MUSC 267	Workshop in Computer Music and Visualization	2			

Graduate-Level Research Requirement

Students in the Global Musics concentration are also required to take **one** graduate-level course. Students may select from a range of courses focused on developing research skills, or seminars providing cross-cultural foundations in social and music theory.

MUSC 200 **cannot** be double counted if taken to satisfy the Research Project option within the Comprehensive Requirement.

MUSC 200	Introduction to Research Methods	5
MUSC 203G	Concepts, Issues, and the Practice of Ethnomusicology	5
MUSC 253A	Historical Perspectives in Musicology and Ethnomusicology	5
MUSC 253B	Rhythm, Time, and Form	5
MUSC 253C	Music and Discourse	5
MUSC 254D	Organology and Acoustics	5

Disciplinary Communications (DC) Requirement

Students of every major must satisfy that major's upper-division disciplinary communication (DC) requirement. The DC requirement for the music B.A. degree is satisfied by completing two courses from the following list.

The D.C. requirement can be fulfilled by taking one of the following courses as your upper-division electives, or as the upper-division component to two of your chosen modules. These courses **can** double between acting as D.C. courses and as modular/elective courses.

MUSC 101A	History of Western Art Music (Medieval, Renaissance, and Baroque)	5
MUSC 101B	History of Western Art Music	5
MUSC 101C	History of Western Art Music	5
MUSC 105A	Music of the United States	5
MUSC 105C	Folk and Traditional Music in California	5

Comprehensive Requirement

The senior comprehensive requirement (capstone) is a two-part requirement that is satisfied by 1) enrollment in one of the course listed below, and 2) an independent study course with your faculty advisor. The options for senior capstones focus in two areas: research project or creative portfolio.

The research project option requires a 15-25 page research paper, which is accomplished by taking the independent study course MUSC 195A (Senior Thesis) with their faculty advisor, concurrently with one of the listed research courses.

The creative portfolio option requires either a senior composition or recital, both accompanied by a 7-10 page short thesis. If a student chooses to do the creative portfolio options, they must concurrently enroll in the independent study course MUSC 196A (Global Musics Capstone) with their faculty advisor.

Research Project

Choose one of the following courses. Cannot double count with modular or upper-division electives.

MUSC 200 **cannot** be double counted if taken to satisfy the Graduate-Level Research Requirement.

MUSC 105A	Music of the United States	5
MUSC 105C	Folk and Traditional Music in California	5
MUSC 105E	Early Keyboard Music	5
MUSC 105I	Improvisation and Collaborative Practices in the 20th Century	5
MUSC 105M	Solo Song: from Monophony to Monody	5
MUSC 105O	Opera from Peri to Pergolesi	5
MUSC 105P	The Piano	5
MUSC 105Q	The String Quartet from Haydn to the Present	5
MUSC 105R	History of Russian Music	5
MUSC 180A	Studies in World Musics: Asia and the Pacific	5
MUSC 180B	Studies in World Musics: Africa and the Americas	5
MUSC 180C	Studies in World Musics: Central Asia	5
MUSC 180D	Music of Insular Southeast Asia	5
MUSC 199	Tutorial	5
MUSC 200	Introduction to Research Methods	5

Take concurrently with selected course above

Students that select the research option for their capstone must also enroll in:		
MUSC 195A	Senior Thesis	5

Creative Portfolio

Choose one of the following courses. Cannot double count with modular or upper-division electives.

MUSC 120	Seminar in Music Composition	5
MUSC 150A	Music Analysis for Performers	5
MUSC 150C	Special Topics in Music Theory: Tonal Counterpoint	5
MUSC 150I	Special Topics in Music Theory: Hindustani Music	5
MUSC 150P	Special Topics in Music Theory: 20th-Century Popular Song	5
MUSC 150S	Focus on Spontaneous Composition	5
MUSC 150T	Post Tonal Analysis	5
MUSC 150X	Theoretical Practices of American Music	5
MUSC 199	Tutorial	5
MUSC 203H	Area Studies in Performance Practice	5

3rd (jr)

Module: Lower-div 3

Module: Ensemble 2

Elective ensemble

Module: Upper-div 2(D.C. poss.)

Module: Upper-div 3 (D.C. poss.)

Elective: Upper-div (D.C. poss.)

Module: Ensemble 3

Module: Ensemble 3

Elective ensemble

4th (sr)

Research Foundations

Elective: Upper-div (D.C. poss.)

Capstone: Upper-div (D.C. poss.)

Capstone: MUSC 195A or MUSC 196A

Take concurrently with selected course above

Students that select the creative portfolio option for their capstone must also enroll in:

MUSC 196A	Senior Recital Preparation (without individual lessons)	5
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Planners

In addition to core curriculum requirements for the Global Musics Concentration, students must also complete three modules. Each module will consist of:

- a lower-division MUSC 11, MUSC 80, or MUSC 81-series course specific to each module (three total)
- an upper-division MUSC 101, MUSC 105, MUSC 150, or MUSC 180 course specific to each module (three total)
- two quarters of performing ensemble or performance practice workshop specific to each module (six total)

Four-Year Plan for Incoming Frosh

Year	Fall	Winter	Spring
1st (frosh)	MUSC 16	MUSC 14	Module: Lower-div 1
	Module: Ensemble 1	Module: Ensemble 1	Elective ensemble
2nd (soph)	MUSC 30A	Module: Upper-div 1 (D.C. possible)	Elective: Upper-div (D.C. poss.)
	Module: Ensemble 2	Module: Lower-div 2	

Two-Year Plan for Transfer Students

Year	Fall	Winter	Spring
1st (jr)	MUSC 16	MUSC 14 (if necessary)	Module: Upper-div 1 (D.C. possible)
	Module: Lower-div 1	Module: Lower-div 2	Module: Upper-div 2 (D.C. poss.)
	Module: Ensemble 1	Module: Ensemble 1	Elective ensemble
	Elective ensemble	Module: Ensemble 2	Module: Ensemble 2
2nd (sr)	MUSC 30A	Elective: Upper-div (D.C. poss.)	Capstone: MUSC 195A/MUSC 196A
	Module: Lower-div 3	Elective: Upper-div (D.C. poss.)	Capstone: Upper-div (D.C. poss.)
	Research Foundations	Module: Upper-div 3 (D.C. poss.)	Elective: Upper-div (D.C. poss.)
	Module: Ensemble 3	Module: Ensemble 3	Elective ensemble

General Education (GE) Codes

MUSC 11, MUSC 80 and MUSC 81 series courses will fulfill a variety of GE requirements including: IM, CC, ER, MF, PE-E, PE-H, PE-T, and PR-C.

MUSC 150C, MUSC 150P, MUSC 150T, MUSC 150X fulfill the IM GE requirement. MUSC 150I fulfills the CC GE.

Most, but not all, ensembles satisfy the PR-C or PR-E code GE requirement. Students should check to confirm which courses from the ensembles course list satisfy GE codes.

Students must complete all other general education requirements.

Transfer Student Progress

Some courses from the MUSC 11, MUSC 80, and MUSC 81 series, along with some performing ensembles, can be articulated from courses taken at other institutions. Please email music@ucsc.edu with any questions about course articulations/substitutions.

Western Art Music Concentration

Course Requirements

Lower-Division Courses

Take each of the following courses:

MUSC 30A	Theory, Literature, and Musicianship	5
MUSC 30B	Theory, Literature, and Musicianship	5
MUSC 30C	Theory, Literature, and Musicianship	5

The following course is taken concurrently with the MUSC 30 sequence:

MUSC 60	Fundamental Keyboard Skills	2
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(May be waived by instructor approval, or if the student is taking piano lessons from a UCSC instructor.)

Upper-Division Courses

Take each of the following courses:

MUSC 101A	History of Western Art Music (Medieval, Renaissance, and Baroque)	5
MUSC 101B	History of Western Art Music	5
MUSC 101C	History of Western Art Music	5
MUSC 130	Harmony and Form in 19th-Century and Early 20th-Century Music	5

One course from the MUSC 105 series, Special Topics in History

MUSC 105A	Music of the United States	5
MUSC 105E	Early Keyboard Music	5
MUSC 105I	Improvisation and Collaborative Practices in the 20th Century	5
MUSC 105M	Solo Song: from Monophony to Monody	5
MUSC 105O	Opera from Peri to Pergolesi	5
MUSC 105Q	The String Quartet from Haydn to the Present	5
MUSC 105R	History of Russian Music	5

One course from the MUSC 150 series, Special Topics in Theory

MUSC 150A	Music Analysis for Performers	5
MUSC 150C	Special Topics in Music Theory: Tonal Counterpoint	5
MUSC 150I	Special Topics in Music Theory: Hindustani Music	5
MUSC 150P	Special Topics in Music Theory: 20th-Century Popular Song	5
MUSC 150S	Focus on Spontaneous Composition	5
MUSC 150T	Post Tonal Analysis	5
MUSC 150X	Theoretical Practices of American Music	5

One course from the MUSC 180 series, Studies in World Musics

MUSC 180A	Studies in World Musics: Asia and the Pacific	5
MUSC 180B	Studies in World Musics: Africa and the Americas	5
MUSC 180C	Studies in World Musics: Central Asia	5
MUSC 180D	Music of Insular Southeast Asia	5

One of the following

- One additional class from the MUSC 150 series
- One additional class from the MUSC 180 series
- One of the courses below:

MUSC 121	Orchestration	5
MUSC 122	Conducting	2
MUSC 124	Intermediate Electronic Sound Synthesis	5

A minimum of six quarters of ensembles

All ensembles are 2 credits each and may be repeated. A minimum of one ensemble per quarter can be counted toward fulfillment of the total six quarter requirement.

If two ensembles in one quarter need to be taken to meet time to degree plans approval can be requested to the department Curriculum Committee by email to music@ucsc.edu.

MUSC 1C	University Concert Choir	2
MUSC 2	University Orchestra	2
MUSC 3	Large Jazz Ensemble	2
MUSC 5A	West Javanese Gamelan Ensemble: Beginning	2
MUSC 5B	West Javanese Gamelan Ensemble: Intermediate	2
MUSC 5C	West Javanese Gamelan Ensemble: Advanced	2
MUSC 8A	Beginning Balinese Gamelan	2
MUSC 8B	Advanced Balinese Gamelan	2
MUSC 9	Wind Ensemble	2
MUSC 10	Central Asian Ensemble	2
MUSC 12	Mariachi Ensemble	2

MUSC 158	South African Music Ensemble	2
MUSC 163	Early Music Ensemble	2
MUSC 164	Jazz Ensembles	2
MUSC 164	Jazz Ensembles	2
MUSC 168	Experimental Music Ensemble	2

A minimum of six quarters of individual lessons.

Six quarters of enrollment in any of the courses listed are acceptable for fulfillment of this requirement.

Students can contact the applied instrument instructor of their primary instrument to arrange an audition prior to the start of the quarter. Applied instrument instructor emails are listed on the Music Department website.

Students should work with the applied instructor of their primary instrument to determine which of the courses listed would be appropriate.

The lessons carry an additional course fee. Concurrent enrollment in an appropriate ensemble is required. Consult the Music Student Handbook for more details.

MUSC 61	Individual Lessons: Half Hour	2
MUSC 62	Individual Lessons: One Hour	3
MUSC 161	Individual Lessons: One Hour	3
MUSC 162	Advanced Individual Lessons: One Hour	5
MUSC 196B	Senior Recital Preparation (with individual lessons)	5

Electives

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division disciplinary communication (DC) requirement. The DC requirement in music is satisfied by completing two courses from the MUSC 101 series (MUSC 101A, MUSC 101B, and MUSC 101C). All three of these courses are already part of the core curriculum required for the Western Art Music Concentration.

MUSC 101A	History of Western Art Music (Medieval, Renaissance, and Baroque)	5
MUSC 101B	History of Western Art Music	5
MUSC 101C	History of Western Art Music	5

Comprehensive Requirement

To fulfill the the comprehensive requirement, students may either take an additional MUSC 105 series course or the following course:

MUSC 120	Seminar in Music Composition	5
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Planners

Four-Year Plan for Incoming Frosh

	Fall	Winter	Spring
1st	MUSC 11A	MUSC 14	

(frosh) (recommended)

2nd (soph) MUSC 30A* & MUSC 60 MUSC 30B & MUSC 60 MUSC 30C & MUSC 60

Individual Lessons¹ Individual Lessons Individual Lessons

Ensemble² Ensemble² Ensemble²

3rd (junior) MUSC 130* MUSC 105 MUSC 150

MUSC 101C

Individual Lessons Individual Lessons Individual Lessons

Ensemble² Ensemble² Ensemble²

4th (senior) MUSC 121** MUSC 120 MUSC 180

* Indicates a performance jury requirement at the end of the quarter.

**Select from the following list of options to fulfill this requirement: one additional class from the MUSC 150 or MUSC 180 series, MUSC 121, MUSC 122, or MUSC 124.

¹Students fulfill the individual lessons requirement by taking one of the following courses: MUSC 61, MUSC 62, or MUSC 161.

General Education (GE) Codes

MUSC 11A will fulfill the IM GE requirement.

²Most, but not all, ensembles satisfy the PR-C or PR-E code GE requirement. Students should check to confirm which courses from the ensembles course list satisfy GE codes.

Students must complete all other general education requirements.

Two-Year Plan for Transfer Students

The following two-year plan assumes that the student places into MUSC 30A and has completed most GE requirements.

	Fall	Winter	Spring
1st (jr)	MUSC 30A* & MUSC 60	MUSC 30B & MUSC 60	MUSC 30C & MUSC 60
		MUSC 101A	MUSC 101B

	Individual Lessons ¹	Individual Lessons ¹	Individual Lessons ¹
	Ensemble ²	Ensemble ²	Ensemble ²
2nd (sr)	MUSC 130*	MUSC 105	MUSC 150
	MUSC 101C	MUSC 120	MUSC 180
	MUSC 121		
	Individual Lessons ¹	Individual Lessons ¹	Individual Lessons ¹
	Ensemble ²	Ensemble ²	Ensemble ²

* Indicates a performance jury requirement at the end of the quarter.

¹Students fulfill the individual lessons requirement by taking one of the following courses: MUSC 61, MUSC 62, or MUSC 161.

General Education Codes

MUSC 11A will fulfill the IM GE requirement.

²Most, but not all, ensembles satisfy the PR-C or PR-E GE requirement. Students should check to confirm which courses from the ensembles course list satisfy GE codes. .

Students must complete all other GE requirements.

MUSIC B.M.

Information and Policies

The Music Department at UC Santa Cruz offers two undergraduate degrees: a Bachelor of Arts (B.A.) and a Bachelor of Music (B.M.). The B.A. degree offers a uniquely diverse curriculum, with the option of completing a concentration in either global musics or Western art music. The B.M. degree is designed for students who intend to pursue a career in music performance. The department also offers minors in electronic music, jazz and Western art music, providing more access for music students and students in other disciplines to engage with music during their studies at UC Santa Cruz. Both B.A. and B.M. degrees are distinctive in that they integrate elements of performance, theory, composition, literature, and history and culture. Students leave UC Santa Cruz prepared for graduate studies and music careers in performance, teaching, and the digital arts.

Through these curricular offerings, students will encounter an extraordinarily rich variety of performance opportunities. Specifically, our students engage with music:

- As a cultural practice in ensembles focusing on musical traditions from Europe, Eurasia, Latin America, North America, South Africa, South Asia and Southeast Asia;
- Temporally in ensembles based on Baroque, Classical and contemporary idioms to deepen their understanding of performance practices;

- Technologically in electronic music ensembles and workshops where students experiment with innovative technologies to develop their own projects with the support of their advisors and peers.

Students at UC Santa Cruz have extraordinary performance and professionalization opportunities. All instrument and voice faculty are celebrated professional musicians, who provide unparalleled guidance for students in performance and professional development. Ensemble courses culminate in an end-of-quarter performance, providing students with regular performance opportunities in a world-class recital hall. The electronic music minor provides hands-on opportunities for students to learn a variety of techniques related to electronic sound production, composition and recording in a state-of-the-art studio facility. The Opera Program allows students to be involved in every step of a major production, from concept and design considerations to marketing and arts management. As performers, composers, artistic collaborators and event-organizers, these programs allow students to develop musically and professionally for diverse career paths and industries.

Our programs shape responsible, independent and highly capable young artists that will push the frontiers of their fields. Graduates from the Music Department at UC Santa Cruz are musically attuned and socially engaged global citizens in the 21st century.

Introduction

The B.M. degree is for students who aspire to academic excellence and an advanced performance level. The B.M. degree is designed for exceptionally talented performers. It requires considerably more performance credits and slightly fewer courses in theoretical disciplines. B.M. students will major in an instrument or voice.

Once accepted to the B.M. program, students must take two juries per academic year: at the end of both fall and spring quarter, for continuing review and criticism of proficiency at their primary instrument.

If a student fails to participate in continuing B.M. juries, or does not attain, or maintain, an advanced level, and fails to maintain academic excellence, the Bachelor of Music Committee will re-examine the student's continued participation in the B.M. degree in consultation with the applied instructor. In cases in which the B.M. Committee finds the student did not meet these requirements the students will be dismissed from the B.M. program with an option to switch to the B.A. degree.

Time to degree: The determination of a dismissal can be made by the committee as long as a student has three remaining quarters before their expected graduation date. This will ensure enough time to make course changes from a B.M. to B.A. degree. A change to the B.A. degree is 10 to 25 fewer credits to be completed than the B.M. degree.

Students may appeal a dismissal of the B.M. degree by petition to the chair of the Music Department. A letter to the department chair must be submitted within 15 days from the date the notification was mailed. Within 15 days of receipt of the appeal,

the department will notify the student, college, and Office of the Registrar of the decision.

Academic Advising for the Program

General information about the music degrees is available on the department website. Students are also strongly encouraged to consult early with the Music Department advisor to create an academic plan for the major or a minor far in advance of declaration, as early as the summer before beginning at the university.

Transfer students should consult the Transfer Information and Policy section.

Please contact the department advisor by emailing music@ucsc.edu or calling (831) 459-2292. You may also use Slug Success to make an appointment.

Getting Started in the Major

It is essential that students begin the MUSC 30 sequence, ensembles, and applied instruction in fall of their second year or as early as possible to make satisfactory progress toward their degree objectives.

The theory placement exam is for placement of students, including transferring or re-entering students, into the appropriate music core course (MUSC 13, MUSC 14, or MUSC 30A). It includes written sections in the areas of theory and musicianship that emphasize aural recognition and identification of musical structures (intervals, chords, rhythms, meters, etc.), and brief definition of terms relating to music history. Students may prepare for the exam by honing skills in reading both bass and treble clef and in recognizing of melodic and harmonic structures, and complex rhythmic patterns.

Students with a theory background should plan to take the theory placement exam to place into MUSC 30A. Students without any theory background or weak aural skills are not required to take the placement exam and are encouraged to enroll in MUSC 13 or MUSC 14 in their first year. Taking MUSC 13, MUSC 14, or MUSC 15 will help prepare students for the theory placement exam. However, admission to MUSC 30A will be based solely on the theory placement exam scores and not on the final grades of the Preparatory theory courses (MUSC 13, MUSC 14, and MUSC 15).

The theory placement exam is held twice a year: on the Tuesday before instruction begins in fall quarter, from 10:00 a.m.-12:30 p.m., and at the beginning of spring quarter (schedule TBA), both in the Music Center Recital Hall. No sign-up is necessary. Students should bring a pencil. Students can visit the Music Department website to view the sample exam.

Program Learning Outcomes

The B.A. and B.M. programs in music are designed to accomplish the following learning outcomes:

1. Attainment of knowledge and understanding of music in an integrated way, through historical and cultural studies, musicianship, theory, composition, and performance. These studies prepare students to pursue a career in some

aspect of music, to further develop their skills in graduate study, and/or to maintain music as a central part of their lives.

2. Acquisition of musical competency, including literacy (the use of music notation in reading, performing, composing, analyzing, and hearing music).
3. Developing skills of critical thinking and writing about music by taking courses on past and present musical cultures in European and other heritages.
4. Creating music by performing, composing, and improvising.

Major Qualification Policy and Declaration Process

Major Qualification

In order to declare the music major, students must successfully complete MUSC 30A with a grade of "C" or better. A "Pass" grade is also acceptable since letter grades are not required for lower-division courses.

Bachelor of music students must also audition in the fall or spring juries as a "B.M. Audition." Applied instructor approval is required to sign-up for this audition. If the B.M. committee determines that the performance level demonstrated is appropriate for the B.M. program, the student can then declare the B.M. major (in addition to passing MUSC 30A). Students can consult with their applied instrument instructor about this potential. If faculty supports this option they can sign up with the undergraduate advisor for the next available jury.

Students approaching their major declaration deadline quarter (sixth quarter for four-year students, second quarter for transfer students), should reach out to the Music office as soon as possible to set up a declaration advising appointment.

Transfer students should also see the "Transfer Information and Policy" section below.

Appeal Process

Students may appeal a dismissal of the B.M. degree by petition to the chair of the Music Department. A letter to the department chair must be submitted within 15 days from the date the notification was mailed. Within 15 days of receipt of the appeal, the department will notify the student, college, and Office of the Registrar of the decision. Appeals should be submitted in person at Music Center 244, or sent to music@ucsc.edu care of the undergraduate advisor.

If a student is not accepted into the B.M. program via the results of their B.M. audition, they can sign up for the next available jury. Students may audition for the B.M. program a maximum of two times. The latest that they can audition for the B.M. program is in spring quarter of their junior year.

How to Declare a Major

All students should meet with the academic advisor to begin the major declaration process either by making an appointment (via Slug Success), by email to music@ucsc.edu, or by stopping by the department office, Music Center, Room 244 or 248.

Students are also required to meet with a faculty advisor (assigned with help from the academic advisor) as part of the declaration process.

Students should submit a petition to declare as soon as they complete the major qualification requirements or reach their declaration deadline quarter (whichever comes first). The declaration deadline for four-year students is their sixth quarter, and the second quarter for transfer students.

Students petitioning when the campus declaration deadline is imminent, will either be approved, denied, or provided with conditions (e.g. completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed major qualification courses.

Transfer Information and Policy

Transfer Admission Screening Policy

Students planning to apply in this major are not required to complete specific courses for consideration of admission to UC Santa Cruz.

Transfer students are strongly recommended to take some music theory courses before transfer to UC Santa Cruz, which generally enables them to test into MUSC 30A. They should also have completed most general education requirements. Voice students should have completed one introductory college-level language course each in Italian, French, and German.

Getting Started at UC Santa Cruz as a Transfer Student

Transfer students should plan to take the theory placement exam to place into MUSC 14 or MUSC 30A. Students that place into MUSC 14 will be required to take three years to graduate. Students that place into MUSC 30A will be able to graduate within two years.

All transfer students should take the theory placement exam during fall of their first quarter (see below for exam schedule). It is an option for transfer students to take the exam prior to applying to UC Santa Cruz as a practice guide for future preparation. However, students can also visit the Music Department website to view the sample exam.

Transfer students can also take MUSC 14 or MUSC 15 during Summer Session at UC Santa Cruz prior to fall of their arrival. Taking MUSC or MUSC 15 will help prepare students for the theory placement exam and generally results in students placing into MUSC 30A. However, admission to MUSC 30A will be based solely on the theory placement exam scores and not on the MUSC 15 grades.

The theory placement exam is held twice a year: on the Tuesday before instruction begins in fall quarter, from 10:00 a.m.-12:30 p.m., and at the beginning of spring quarter (schedule TBA), both in the Music Center Recital Hall. No sign-up is necessary. Students should bring a pencil. Students can visit the Music Department website to view the sample exam.

All transfer students are strongly encouraged to email music@ucsc.edu to schedule a phone-advising appointment with the undergraduate advisor prior to application.

Letter Grade Policy

All upper-division courses applied toward the music majors must be taken for a letter grade.

Lower-division courses may be taken Pass/No Pass.

[Optional Catchall]

Course Substitution Policy

Double Majors and Major/Minor Combinations Policy

Double majors **are** possible for the music major. A student can double major with a Music B.A. or B.M. degree, and a major from another department. Students that plan to double major should meet with the Music Department undergraduate advisor for course planning in fall quarter of their first year.

It is not possible to double major as a music B.A. and a music B.M. However, it is possible to pursue the B.M. or the B.A. (with a Western Art Music concentration), and additionally add the jazz minor or electronic music minor. It is not possible to add the Western Art Music minor to either of these majors.

Study Abroad

The department encourages students to explore studying abroad while attending UC Santa Cruz. In particular, the UC Santa Cruz Music Department has an exchange program agreement with the Music Department at the University of Sussex. University of Sussex offers many courses that can be substituted for music major or minor requirements.

However, due to the intense nature of the Music B.M. program, students are encouraged to plan potential study abroad far in advance to ensure they are able to maintain their UC Santa Cruz studies.

For more information on approved course substitutions and the exchange program please visit Study Abroad Courses.

Honors

Honors in the major are conferred by vote of the music faculty. B.A. or B.M. students can be awarded honors for excellent work in individual areas, including coursework, senior project (thesis or recital), or a capstone course. Excellent work in any two of these areas normally results in honors in the major.

To be considered for highest honors in the major, B.A. students must complete a senior project (not required for the B.A. degree) and B.M. students must complete a capstone course (not required for the B.M. degree). Honors in all three areas—coursework, senior project, and capstone course—normally results in highest honors in the major.

How Music Majors are Assessed

1. Placement exams at the outset of studies assess students' musical competence, and determine their place in the required lower-division theory and harmony courses.
2. Admission to most performance ensembles is by audition. Assessment is based on successful public performances.
3. A juried "advisory audition" is required for students enrolled in MUSC 30A to give students feedback so that they can work toward meeting the requirements for the proficiency audition at the end of the next fall quarter.
4. A juried "proficiency audition" is required for students enrolled in MUSC 130. All students must exhibit an upper-intermediate or higher level on their major instrument or voice.
5. Auditions for admission to the B.M. program are held at the end of each fall quarter. Students accepted to the program are required to audition twice a year for continuing review and critique. Students in the B.M. program present a Senior Recital which is evaluated by faculty.
6. In required and elective seminars, critical thinking and writing are assessed when students present a major independent project at the end of term.
7. Compositional skills are assessed through the rehearsal and public performance of student works.

[Optional Catchall]

Requirements and Planners

Course Requirements

Lower-Division Courses

Take each of the following courses:

MUSC 30A	Theory, Literature, and Musicianship	5
MUSC 30B	Theory, Literature, and Musicianship	5
MUSC 30C	Theory, Literature, and Musicianship	5

The following course is taken concurrently with the MUSC 30 sequence:

MUSC 60	Fundamental Keyboard Skills	2
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May be waived by instructor approval, or if the student is taking piano lessons from a UC Santa Cruz instructor.

Foreign Language Requirement

FREN 1, GERM 1, and ITAL 1 are required for B.M. voice students. High school transcripts or Advanced Placement (AP) examination scores may satisfy this requirement. Students may take these courses during Summer Session or through any other college. The quarter varies for when each class is offered.

Students should check with the departments offering these courses to determine when they are regularly offered.

There are no foreign language requirements for other students in the B.A. or B.M. programs; however, students who are planning to apply for graduate school are strongly advised to study a language pertinent to their research area.

Upper-Division Courses

Take each of the following courses:

MUSC 101A	History of Western Art Music (Medieval, Renaissance, and Baroque)	5
MUSC 101B	History of Western Art Music	5
MUSC 101C	History of Western Art Music	5
MUSC 130	Harmony and Form in 19th-Century and Early 20th-Century Music	5

One course from the MUSC 105 series, Special Topics in History

MUSC 105A	Music of the United States	5
MUSC 105E	Early Keyboard Music	5
MUSC 105I	Improvisation and Collaborative Practices in the 20th Century	5
MUSC 105M	Solo Song: from Monophony to Monody	5
MUSC 105O	Opera from Peri to Pergolesi	5
MUSC 105Q	The String Quartet from Haydn to the Present	5
MUSC 105R	History of Russian Music	5

One course from the MUSC 150 series, Special Topics in Theory

MUSC 150A	Music Analysis for Performers	5
MUSC 150C	Special Topics in Music Theory: Tonal Counterpoint	5
MUSC 150I	Special Topics in Music Theory: Hindustani Music	5
MUSC 150P	Special Topics in Music Theory: 20th-Century Popular Song	5
MUSC 150S	Focus on Spontaneous Composition	5
MUSC 150T	Post Tonal Analysis	5
MUSC 150X	Theoretical Practices of American Music	5

One course from the MUSC 180 series, Studies in World Musics

MUSC 180A	Studies in World Musics: Asia and the Pacific	5
MUSC 180B	Studies in World Musics: Africa and the Americas	5
MUSC 180C	Studies in World Musics: Central Asia	5
MUSC 180D	Music of Insular Southeast Asia	5

B.M. students who wish to specialize in jazz

Take all the following three courses instead of one course from the MUSC 180 series:

MUSC 111B	Seminar in Jazz Analysis	5
MUSC 174	Intermediate Spontaneous Composition and Improvisation	5
MUSC 175	Jazz Theory II	5

A minimum of 12 quarters of ensembles

All ensembles are 2 credits each and may be repeated. A maximum of one ensemble per quarter can be counted toward fulfillment of the total 12-quarter requirement.

Transfer students are required to take six quarters of ensembles.

If two ensembles in one quarter need to be taken to meet time to degree plans approval can be requested to the department

Curriculum Committee by email to music@ucsc.edu.

MUSC 1C	University Concert Choir	2
MUSC 2	University Orchestra	2
MUSC 3	Large Jazz Ensemble	2
MUSC 5A	West Javanese Gamelan Ensemble: Beginning	2
MUSC 5B	West Javanese Gamelan Ensemble: Intermediate	2
MUSC 5C	West Javanese Gamelan Ensemble: Advanced	2
MUSC 8A	Beginning Balinese Gamelan	2
MUSC 8B	Advanced Balinese Gamelan	2
MUSC 9	Wind Ensemble	2
MUSC 10	Central Asian Ensemble	2
MUSC 12	Mariachi Ensemble	2
MUSC 102	University Orchestra	2
MUSC 103	University Concert Choir	2
MUSC 158	South African Music Ensemble	2
MUSC 163	Early Music Ensemble	2
MUSC 164	Jazz Ensembles	2
MUSC 166	Chamber Singers	2
MUSC 168	Experimental Music Ensemble	2

A minimum of 11 quarters of individual lessons.

Eleven quarters of enrollment in any of the courses listed are acceptable for fulfillment of this requirement.

Transfer students are required to take six quarters of applied instruction.

Students can contact the applied instrument instructor of their primary instrument to arrange an audition prior to the start of the quarter. Applied instrument instructor emails are listed on the department website.

Students should work with the applied instructor of their primary instrument to determine which of the courses listed would be appropriate.

The lessons carry an additional course fee. Concurrent enrollment in an appropriate ensemble is required. Consult the Music Student Handbook for more details.

MUSC 61	Individual Lessons: Half Hour	2
MUSC 62	Individual Lessons: One Hour	3
MUSC 161	Individual Lessons: One Hour	3
MUSC 162	Advanced Individual Lessons: One Hour	5

Continuing B.M. Juries

Demonstration of an advanced level at Continuing B.M. juries each fall and spring quarter

Complete the following course

MUSC 196B	Senior Recital Preparation (with individual lessons)	5
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Electives**Disciplinary Communication (DC) Requirement**

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement in music is satisfied by completing MUSC 101A and MUSC 101C (already a part of the core curriculum and required for the B.A. and B.M.).

Comprehensive Requirement

Students fulfill the comprehensive requirement by completing MUSC 196B.

Planners**B.M.—Four-Year Plan for Incoming Fresh**

	Fall	Winter	Spring
1st (frosh)	MUSC 11A (recommended)	MUSC 15	Language ¹
	Individual Lessons ²	Individual Lessons	Individual Lessons
	Ensemble	Ensemble	Ensemble
2nd (soph)	MUSC 30A*	MUSC 30B	MUSC 30C**
	Individual Lessons	MUSC 101A	MUSC 101B
	Individual Lessons	Individual Lessons	Individual Lessons
	Ensemble	Ensemble	Ensemble
3rd (junior)	MUSC 130**	MUSC 105	MUSC 150**
	MUSC 101C		
	Individual Lessons	Individual Lessons	Individual Lessons

	Ensemble	Ensemble	Ensemble
4th (senior)	Language	Language	MUSC 180
	Individual Lessons	Individual Lessons	MUSC 196B
	Ensemble	Ensemble	Ensemble

* Indicates a performance jury requirement at the end of the quarter.

**Following acceptance to the B.M. program via audition (can be done anytime up to the end of the third year), continuing B.M. students complete "Continuing B.M." juries at the end of each fall and spring quarter.

¹Bachelor of music voice majors are required to take FREN 1, GERM 1, and ITAL 1. High school transcripts or AP scores may satisfy this requirement. Students may take these courses during Summer Session or through any other college. The quarter varies for when each class is offered. Students should check with the departments offering these courses to determine when they are regularly offered.

²Students fulfill the individual lessons requirement by taking one of the following courses: MUSC 61, MUSC 62, or MUSC 161.

General Education (GE) Codes

MUSC 11A will fulfill the IM general education requirement.

³Most, but not all, ensembles satisfy the PR-C or PR-E general education requirement. Students should check to confirm which courses from the ensembles course list satisfy GE codes.

Students must complete all other GE requirements.

B.M.—Two-Year Plan for Incoming Transfer Students

The two-year plan assumes that the student places into MUSC 30A, and has completed most GE requirements. Voice students are assumed to have completed introductory language courses prior to transfer. Transfer students are required to take six quarters of lessons and ensembles at UCSC.

	Fall	Winter	Spring
1st (junior)	MUSC 30A*	MUSC 30B	MUSC 30C**
		MUSC 101A	MUSIC 101B
	Individual Lessons ¹	Individual Lessons	Individual Lessons
	Ensemble ²	Ensemble	Ensemble
2nd (senior)	MUSC 130*	MUSC 105	MUSC 196B
	MUSC 101C	MUSC 150	MUSC 180
	Individual	Individual	Individual

Lessons	Lessons	Lessons
Ensemble	Ensemble	Ensemble

* Indicates a performance jury requirement at the end of the quarter.

**Following acceptance to the B.M. program via audition (can be done anytime up to the end of the third year), continuing B.M. students complete "Continuing B.M." juries at the end of each fall and spring quarter.

¹Students fulfill the individual lessons requirement by taking one of the following courses: MUSC 61, MUSC 62, or MUSC 161.

Bachelor of Music voice majors are required to take FREN 1, GERM 1, and ITAL 1. High School transcripts or AP scores may satisfy this requirement. Students may take these courses during Summer Session or through any other college. The quarter varies for when each class is offered. Students should check with the departments offering these courses to determine when they are regularly offered.

General Education Codes

²Most, but not all, ensembles satisfy the PR-C or PR-E general education requirement. Students should check to confirm which courses from the ensembles course list satisfy GE codes.

WESTERN ART MUSIC MINOR

The undergraduate minor program in Western art music offers a course of study leading to the minor in music. The goal of this program is to provide a focus for music activities, as well as a background in music theory, history, and performance.

Course Requirements

Lower-Division Courses

Choose one of the following courses:

MUSC 11A	Introduction to Western Classical Music	5
MUSC 11D	Introduction to World Music	5

MUSC 11A formerly Introduction to Western Art Music

Plus all of the following courses:

MUSC 30A	Theory, Literature, and Musicianship	5
MUSC 30B	Theory, Literature, and Musicianship	5
MUSC 30C	Theory, Literature, and Musicianship	5

Plus three quarters of the following lower-division instrumental/voice lesson course:

MUSC 61	Individual Lessons: Half Hour	2
MUSC 62	Individual Lessons: One Hour	3
MUSC 63	Group Instrumental and Vocal Lessons	2

Upper-Division Courses

Six quarters of upper-division ensembles

MUSC 102	University Orchestra	2
MUSC 103	University Concert Choir	2
MUSC 158	South African Music Ensemble	2
MUSC 163	Early Music Ensemble	2
MUSC 164	Jazz Ensembles	2
MUSC 166	Chamber Singers	2

Students can petition to take lower-division ensembles, rather than upper-division ensembles. Petitions can be sent to music@ucsc.edu.

Plus three quarters of the following upper-division instrumental/voice lessons course:

MUSC 161	Individual Lessons: One Hour	3
MUSC 161A	Individual Lessons: Half Hour	2
MUSC 161B	Group Instrumental & Vocal Lessons	2

(Fee: \$650 per quarter)

One course from the following list:

MUSC 101A	History of Western Art Music (Medieval, Renaissance, and Baroque)	5
MUSC 101B	History of Western Art Music	5
MUSC 101C	History of Western Art Music	5
MUSC 180A	Studies in World Musics: Asia and the Pacific	5
MUSC 180B	Studies in World Musics: Africa and the Americas	5
MUSC 180C	Studies in World Musics: Central Asia	5
MUSC 180D	Music of Insular Southeast Asia	5

Planner

Two-Year Music Minor Plan

	F a ll	Wi nte r	Sp ri ng	1st	MU SC 11A *		
				MU SC 61, MU SC 62 or MU SC 63	MU SC 61, MU SC 62 or MU SC 63	MU SC 61, MU SC 62, or MU SC 63	
				Ens emb le	Ens emb le		

2nd				MU SC 30A	MU SC 30B	MU SC 30C
					MU SC 101 A**	
				MU SC 161 A, MU SC 161 B or MU SC 161	MU SC 161 A, MU SC 161 B or MU SC 161	MU SC 161 A, MU SC 161 B or MU SC 161
			Ens emb le	Ens emb le	Ens emb le	

*Satisfies the MUSC 11 requirement; can be replaced with MUSC 11D

**Satisfies upper-division requirement; can be replaced with MUSC 101B or MUSC 101C or a MUSC 180 series course.

ELECTRONIC MUSIC MINOR

The electronic music minor focuses on the study of creating music using the tools of modern technology. It is designed to complement the music major or programs in other media by providing instruction in advanced skills of audio production, sound synthesis, and computer-assisted composition.

Course Requirements

Lower-Division Courses

One course from the following:

MUSC 11A	Introduction to Western Classical Music	5
MUSC 11B	Introduction to Jazz	5
MUSC 11D	Introduction to World Music	5
MUSC 80P	Popular Music in the United States	5

Plus the following course:

MUSC 80C	History, Literature, and Technology of Electronic Music	5
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Plus one of the following courses to fulfill the music theory requirement

Students must take the Theory Placement Exam in order to test into the appropriate music theory course (MUSC 13, MUSC 14, or MUSC 30A). If a student places into MUSC 30A, they will satisfy the theory requirement. Students who place into MUSC

13 must complete this course and MUSC 14 to meet the theory requirement.

MUSC 14	Beginning Theory & Musicianship II	5
MUSC 15	Preparatory Musicianship	5

Upper-Division Courses

Take each of the following courses:

MUSC 123	Electronic Sound Synthesis	5
MUSC 124	Intermediate Electronic Sound Synthesis	5
MUSC 125	Advanced Electronic Sound Synthesis	5

Two quarters of the following courses:

MUSC 167	Workshop in Electronic Music	2
MUSC 167R	Recording Workshop	2

MUSC 167 can be repeated, but MUSC 167R can only be taken once.

One of the following:

MUSC 80L	Artificial Intelligence and Music	5
MUSC 80R	Music in the Digital Age	5
PHYS 80U	Physics and Psychophysics of Music	5
MUSC 80Z	Laptop Music	5
FILM 171A	Sound	5
THEA 114	Sound Design and Engineering for the Theater	5

Or a similar music course that has a technical focus as approved by the department

One of the following courses:

PHYS 160	Practical Electronics	5
ECE 101	Introduction to Electronic Circuits	5
ECE 153	Digital Signal Processing	5
ECE 171	Analog Electronics	5
CSE 20	Beginning Programming in Python	5
CSE 5J	Introduction to Programming in Java	5

JAZZ SPONTANEOUS COMPOSITION AND IMPROVISATION MINOR

Course Requirements

The Jazz, Spontaneous Composition and Improvisation minor focuses on the study of the history, theory, and performance of jazz and other improvised musics. In addition, students may be introduced to musical styles that have had profound influences on the uniquely American art form of jazz: folk and popular musics of Africa, Europe, South Asia and the United States and Western classical music. The Jazz, Spontaneous Composition and Improvisation minor is limited to students who have

sufficient performance proficiency to pass auditions for entry into the jazz ensembles.

Lower-Division Courses

MUSC 13 is designed for students with barely any or no music theory experience. MUSC 14 and MUSC 15 are meant for students with some music theory experience—you only need to take one of MUSC 14 or MUSC 15, not both.

Students may test out of MUSC 13, MUSC 14, and MUSC 15 by placing directly into MUSC 30A via the Theory Placement Exam.

The Theory Placement Exam is offered twice per year—in fall quarter, the Tuesday before classes start; and in the beginning of spring quarter. See the Music Department website for exam details.

MUSC 11B	Introduction to Jazz	5
MUSC 13	Beginning Theory & Musicianship I	5
MUSC 14	Beginning Theory & Musicianship II	5
MUSC 15	Preparatory Musicianship	5
MUSC 30A	Theory, Literature, and Musicianship	5

Take one of the following options

Take one of the following courses:

MUSC 74	Spontaneous Composition/Improvisation I	5
MUSC 75	Jazz Theory I	5

Or

In place of MUSC 74 or MUSC 75, students may elect to take two quarters of the following course (which may be repeated for credit):

MUSC 3	Large Jazz Ensemble	2
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Upper-Division Courses

Take one of the following courses:

MUSC 174	Intermediate Spontaneous Composition and Improvisation	5
MUSC 175	Jazz Theory II	5

Take two of the following courses:

MUSC 105A	Music of the United States	5
MUSC 105C	Folk and Traditional Music in California	5
MUSC 105I	Improvisation and Collaborative Practices in the 20th Century	5
MUSC 203H	Area Studies in Performance Practice	5
MUSC 111B	Seminar in Jazz Analysis	5
MUSC 150I	Special Topics in Music Theory: Hindustani Music	5
MUSC 150S	Focus on Spontaneous Composition	5

MUSC 203B	Performance Practice in the Renaissance	5
MUSC 203H	Area Studies in Performance Practice	5

MUSC 203H may be repeated for credit if taken with a different instructor.

Ensembles

Students in the Jazz, Spontaneous Composition and Improvisation minor are required to take six quarters of ensembles, at least three quarters of which must be jazz-focused ensembles (MUSC 3 or MUSC 164). The other three quarters can be any ensemble.

If a student elected to take two quarters of MUSC 3 instead of MUSC 74 or MUSC 75, they are only required to do one additional quarter of a jazz ensemble, plus the three quarters of elective ensembles.

MUSC 1C	University Concert Choir	2
MUSC 2	University Orchestra	2
MUSC 3	Large Jazz Ensemble	2
MUSC 5A	West Javanese Gamelan Ensemble: Beginning	2
MUSC 5B	West Javanese Gamelan Ensemble: Intermediate	2
MUSC 5C	West Javanese Gamelan Ensemble: Advanced	2
MUSC 8A	Beginning Balinese Gamelan	2
MUSC 8B	Advanced Balinese Gamelan	2
MUSC 9	Wind Ensemble	2
MUSC 10	Central Asian Ensemble	2
MUSC 12	Mariachi Ensemble	2
MUSC 12B	Mexican Folklorico Music and Dance	2
MUSC 54	North Indian Music Workshop	2
MUSC 55	Rhythms of North India	2
MUSC 55A	Intermediate Rhythms of North India	2
MUSC 74	Spontaneous Composition/Improvisation I	5
MUSC 75	Jazz Theory I	5
MUSC 80Z	Laptop Music	5
MUSC 102	University Orchestra	2
MUSC 103	University Concert Choir	2
MUSC 158	South African Music Ensemble	2
MUSC 163	Early Music Ensemble	2
MUSC 164	Jazz Ensembles	2
MUSC 166	Chamber Singers	2
MUSC 168	Experimental Music Ensemble	2

MUSIC M.A.

Introduction

The Master of Arts (M.A.) degree program in music has emphases in composition, musicology/ethnomusicology, or performance practice, and integrates studies in performance, composition/analysis, and research. In consultation with a faculty advisor, the student pursues a two-year course of studies culminating in a final project that combines an original

composition, written thesis, or essay with a related public performance or lecture recital.

Requirements

Course Requirements

A minimum of 60 course credits completed at UC Santa Cruz is required for the degree. All M.A. students are required to complete the following core courses:

MUSC 200	Introduction to Research Methods	5
MUSC 201	History of Music Theory from the Greeks Through Rameau	5
MUSC 202	Tonal and Posttonal Analysis	5
MUSC 252	Current Issues Colloquium	

Students entering the program Fall 2007 and later take MUSC 252 each quarter they are in residence.

Students with an emphasis in composition also complete:

MUSC 219	Techniques in Composition	5
MUSC 220	Graduate Seminar in Music Composition	5

Plus one course in the MUSC 203 Performance

Practice series		
MUSC 203A	Performance Practice in the Middle Ages	5
MUSC 203B	Performance Practice in the Renaissance	5
MUSC 203C	Performance Practice in the Baroque	5
MUSC 203D	Performance Practice in the Classic Period	5
MUSC 203E	Performance Practice in the Romantic Period	5
MUSC 203F	Performance Practice in the 20th Century	5
MUSC 203G	Concepts, Issues, and the Practice of Ethnomusicology	5
MUSC 203H	Area Studies in Performance Practice	5

Students with an emphasis in musicology/ethnomusicology or performance practice also complete:

Three courses from the Music 203 Performance

Practice series		
MUSC 203A	Performance Practice in the Middle Ages	5
MUSC 203B	Performance Practice in the Renaissance	5
MUSC 203C	Performance Practice in the Baroque	5
MUSC 203D	Performance Practice in the Classic Period	5
MUSC 203E	Performance Practice in the Romantic Period	5

MUSC 203F	Performance Practice in the 20th Century	5
MUSC 203G	Concepts, Issues, and the Practice of Ethnomusicology	5
MUSC 203H	Area Studies in Performance Practice	5

MUSC 206D: Music Perception and Cognition meets the requirement for one MUSC 203 course. It is possible, in some cases, to substitute a course from the MUSC 253 or MUSC 254 series for one MUSC 203 course. Students should contact the graduate advisor for more information on petitioning the Graduate Committee for course substitutions.

Other Requirements

The final project for the degree includes both performing and scholarly components, which vary according to the degree emphasis.

Two types of master's degrees are offered: "A Thesis Plan I master's requires a research thesis, while a Capstone Plan II master's has a capstone requirement, which may be a comprehensive exam, an individual project, or a group project."

Students with a composition emphasis will complete a Thesis Plan I masters. Students with this emphasis submit a thesis composition together with an essay that addresses historical, technical, and/or interpretive issues of the music (MUSC 299); and they complete a full-length recital (MUSC 298) of their compositional work.

Students with a musicology/ethnomusicology emphasis will complete a Thesis Plan I master's, regardless of whether or not they complete a performance or lecture-recital. Students with this emphasis will complete a thesis (MUSC 299) and may choose to give a short performance or lecture-recital related to the thesis (MUSC 298).

Students with a performance practice emphasis will usually complete a Capstone Plan II master's and write a short essay to accompany a recital, but may have the option to choose a Thesis Plan I master's instead. Students in this emphasis complete a full-length recital (MUSC 298) and an accompanying short essay that addresses historical, technical, and/or interpretive aspects of the music performed in the recital. Students in this emphasis whose main area is conducting complete a full-length recital (MUSC 298) and one of the following: a shorter lecture-recital, a short analytical or contextual essay on a different topic, or a collaboration with a graduate student composer or faculty composer on a premiere public performance. Students are encouraged to create a program involving corollary studies such as computer studies, area cultural studies, linguistics, anthropology, theater arts, and visual arts.

Letter Grade Policy

Graduate students must take all core courses for a letter grade. These courses include the following: MUSC 200, MUSC 201, MUSC 202, MUSC 203A-H, MUSC 206A-D, MUSC 219, MUSC 220, MUSC 253A-D, and MUSC 254A-M. Graduate students must take all courses for a letter grade with the exception of independent study courses (MUSC 261, MUSC

265, MUSC 295, MUSC 297, MUSC 298, and MUSC 299) and the colloquium course (MUSC 252), which may be taken with the Satisfactory/Unsatisfactory grade option. Grades of C or D do not satisfy any course requirement for a music graduate degree.

[Optional Catchall]

Applying for Graduation

Students should contact the graduate advisor to confirm that all requirements for the M.A. degree have been met and to complete the Graduate Division "Application for the M.A. Degree" form.

MUSIC D.M.A.

Introduction

The Doctor of Musical Arts (D.M.A.) degree program in music composition focuses on computer-assisted composition and world music composition. Computer-assisted composition includes algorithmic techniques for the generation of musical materials and structures to be realized in the creation of instrumental, vocal, and digitally synthesized music. World music composition addresses a variety of compositional approaches influenced by indigenous world musics, with a focus upon those musics taught by faculty composers, ethnomusicologists, and applied instructors. The D.M.A. program seeks to develop accomplished, active, and articulate composers who have a broad awareness of the diverse styles, cultural influences, media, venues, and technical means available to them in the 21st century.

Advancement to Candidacy

Course Requirements

For students entering with the bachelor's degree, a minimum of 102 credits in coursework at UC Santa Cruz will be required. All students must be in residence for a minimum of nine quarters. Students must enroll in a minimum of 10 credits each quarter until they advance to candidacy. After advancing to candidacy, students remaining in residence must take a minimum of one 5-credit course each quarter.

For students entering with a master's degree from another institution, a minimum of 72 credits in coursework at UC Santa Cruz will be required. All students must be in residence for a minimum of six quarters. Students must enroll in a minimum of 10 credits each quarter until they advance to candidacy. After advancing to candidacy, students remaining in residence must take a minimum of one 5-credit course each quarter. D.M.A. students are expected to complete the degree within a maximum of six calendar years from entrance to the program (leaves of absence are not excluded from this count).

Students entering the D.M.A. program with a bachelor's degree must take the following course:

MUSC 200	Introduction to Research Methods	5
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Students entering the D.M.A. with an M.A. degree in a field other than music should consult their adviser about taking MUSC 200, Research Methods.

All students entering the DMA program must take the following courses:

MUSC 202	Tonal and Posttonal Analysis	5
MUSC 219	Techniques in Composition	5
MUSC 220	Graduate Seminar in Music Composition	5
MUSC 206A	World Music Composition	5
MUSC 206B	Computer-Assisted Composition	5

Current Issues Colloquium

Before advancing to candidacy, all DMA students must enroll in MUSC 252, Current Issues Colloquium, each quarter in residence. MUSC 252 may be taken satisfactory/unsatisfactory or for a letter grade.

Five quarters of independent study:

MUSC 297	Independent Study	5
MUSC 298	Graduate Recital	5
MUSC 299	Thesis Research	5

D.M.A. students must take at least five quarters of independent study.

MUSC 297 is taken in preparation for the Qualifying Exams.

MUSC 297 is typically taken the quarter of the Qualifying Recital.

MUSC 299 is usually taken after advancing to candidacy, in preparation for the dissertation.

Elective Requirements

D.M.A. students must take at least two of the following elective courses.

Note that if students elect to take MUSC 267, Workshop in Computer Music and Visualization, to satisfy one elective requirement, two quarters of the course are required.

MUSC 201	History of Music Theory from the Greeks Through Rameau	5
MUSC 267	Workshop in Computer Music and Visualization	2
MUSC 203H	Area Studies in Performance Practice	5
MUSC 203G	Concepts, Issues, and the Practice of Ethnomusicology	5

Foreign Language Requirements

Current skill in reading and comprehension of a relevant foreign language must be demonstrated by:

1. Satisfactory completion of level 3 of a foreign language at UCSC, preferably in the first year of the program; or
2. Submission of an official transcript documenting successful completion of one year of university-level

foreign language at another institution (equivalent to level 3 at UCSC); or

3. Passing a foreign language proficiency examination administered by the Music Department in French, Spanish, German, Italian, or Russian. (This test requires translation of a passage of at least 600 words with no resources other than a dictionary to be completed in 1.5 hours.)
4. For languages other than French, Spanish, German, Italian, or Russian, the department may accept completion of an online course as fulfilling the requirement if the student can prove equivalency to a level 3 course at UCSC. The graduate committee will determine whether or not to accept any such course.

With approval of the primary adviser, students whose emphasis is algorithmic composition may complete three quarters or one year of university-level instruction in computer programming in lieu of the foreign language requirement.

Ph.D. students are required to demonstrate proficiency in a foreign language according to the same procedures as the M.A. or D.M.A. In addition, Ph.D. students are required during their first year of enrollment to demonstrate proficiency in a second foreign language relevant to their area of interest.

Knowledge of languages not offered at UCSC must be demonstrated as determined by the Music Department's graduate committee. Graduate Division policy states that the language requirement must be completed prior to taking the qualifying examination.

Teaching Requirement

Pre-Qualifying Requirements

Pre-Qualifying Reviews

Before the end of the first year of study, all D.M.A. students must present a half recital of their compositions from that year, and submit the scores and recital recording as a portfolio, which faculty will use to assess the student's progress in the program. Faculty may also consider the student's performance in MUSC 200, MUSC 201, and/or MUSC 202. In unusual cases, when progress has been minimal, faculty reserves the right to terminate a student's enrollment in the program. Typically, the half recital is satisfied by a combination of 1) participation in a concert of graduate-student compositions sponsored each April by the Music Department, and 2) participation in a public reading of graduate-student final projects from MUSC 219 and MUSC 220.

The Qualifying Recital

At the end of their second year of study, all students admitted to the D.M.A. program must present a half-recital (35-40 minutes of music) representing their best work since entering the program. The D.M.A. qualifying recital will be evaluated by the student's primary adviser and by a second faculty member (generally a second composer) selected by the student in consultation with the primary adviser.

Dissertation Prospectus

The dissertation prospectus must be submitted 12 months before the scheduled qualifying examination. The prospectus must include a proposal describing the scope and nature of the dissertation composition and the accompanying essay. In addition to defining the parameters of the dissertation itself, the dissertation prospectus will suggest to the student's qualifying examination committee three areas of study to be emphasized in the student's qualifying examination. The three topics must be designed to prepare the student for an informed and successful completion of the dissertation project.

Qualifying Examination

Advancement to candidacy is contingent upon the passing of a written examination and an oral examination normally administered at the end of year three for students entering with a bachelor's degree, and the end of year two or the beginning of year three for students entering with a master's degree from another institution. For the written portion of the examination, the qualifying examination committee provides questions on the three topics assigned as areas of emphasis. The oral examination is administered by the student's qualifying examination committee and may concern any aspect of the assigned topics with an emphasis on those issues addressed in the written portion of the examination. Advancement to candidacy will be granted after successful completion of the written and oral examinations, acceptance of the dissertation reading committee form, satisfactory completion of coursework and the foreign language requirement, and the payment of the necessary fees.

Post-Qualifying Requirements

After advancing to candidacy, students must enroll in at least one quarter of MUSC 299, Thesis Research, in preparation for the dissertation.

Letter Grade Policy

Graduate students must take all core courses for a letter grade. These courses include the following: MUSC 200, MUSC 201, MUSC 202, MUSC 203A-H, MUSC 206A-D, MUSC 219, MUSC 220, MUSC 253A-D, and MUSC 254A-M. Grades of C or D do not satisfy any course requirement for a music graduate degree.

Independent study courses (MUSC 261, MUSC 265, MUSC 295, MUSC 297, MUSC 298, and MUSC 299) and the colloquium course (MUSC 252) may be taken with the satisfactory/unsatisfactory grade option.

[Optional Catchall]

Dissertation

Dissertation

D.M.A. students must complete a dissertation consisting of a substantial musical composition accompanied by an essay. One to two years of work beyond the qualifying examinations should be sufficient for the completion of the dissertation, except in cases where extended fieldwork is required.

Dissertation Defense

The final examination will be a public oral defense of the dissertation. After an oral presentation by the candidate, the candidate will be questioned by the dissertation committee.

Academic Progress

For more information about maintaining academic good standing, students should consult the Academic Requirements and Standards section of the Division of Graduate Studies Handbook.

Applying for Graduation

For more information on applying for graduation, students should make an appointment with the Graduate Program adviser and consult UCSC's Graduate Division Handbook.

[Optional Catchall]

MUSIC PH.D.

Introduction

The Doctor of Philosophy (Ph.D.) degree in music has an emphasis in cross-cultural studies, and aims to provide doctoral students with an integrative framework for music scholarship, emphasizing the ways in which musicology and ethnomusicology interact and complement one another.

In addition to cultural approaches to musical style, the program also encourages the integration of scholarly research with musical performance, emphasizing the manner in which performance serves both rhetorical and symbolic ends within various cultural settings. To this end the concept of "performance practice" plays a significant role in this program, given that the concept of historically or culturally informed performance is applicable to music from the earliest times to the present day in all geographical and cultural regions, and can encompass research activities as diverse as fieldwork, historical editing, and recording, as well as publishing of books and articles on the traditions of composition and performance.

Advancement to Candidacy

Course Requirements

Students entering the Ph.D. program with a bachelor's degree are required to complete the following course:

MUSC 200	Introduction to Research Methods	5
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Plus three courses from the MUSC 203 Performance

Practice series:

MUSC 203A	Performance Practice in the Middle Ages	5
MUSC 203B	Performance Practice in the Renaissance	5
MUSC 203C	Performance Practice in the Baroque	5
MUSC 203D	Performance Practice in the Classic Period	5

MUSC 203E	Performance Practice in the Romantic Period	5
MUSC 203F	Performance Practice in the 20th Century	5
MUSC 203G	Concepts, Issues, and the Practice of Ethnomusicology	5
MUSC 203H	Area Studies in Performance Practice	5

MUSC 206D or a course in the MUSC 254 series may each substitute for one 203 course.

Plus two courses from the MUSC 253 series:

MUSC 253A	Historical Perspectives in Musicology and Ethnomusicology	5
MUSC 253B	Rhythm, Time, and Form	5
MUSC 253C	Music and Discourse	5
MUSC 253D	Issues in the Ethnography of Music	5

Plus three courses from the MUSC 254 series:

MUSC 254C	Performativity and Music	5
MUSC 254D	Organology and Acoustics	5
MUSC 254E	Asian Resonances in 20th-Century American and European Music	5
MUSC 254J	Jazz Historiography	5
MUSC 254K	Music, Gender, and Sexuality	5
MUSC 254L	John Cage: Innovation, Collaboration, and Performance Technologies	5
MUSC 254M	Music in San Francisco, 1850-1950	5
MUSC 254N	Cruising the Postcolony	5
MUSC 254O	Historiography of American Music	5
MUSC 254R	Research Design and Grant Writing for Music Scholars	5

Plus the following course during each quarter of residence:

MUSC 252	Current Issues Colloquium
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Students must enroll in MUSC 252, Current Issues Colloquium, until advancing to candidacy.

Elective Requirements

Students entering the Ph.D. program with a bachelor's degree must take three elective graduate seminars, one of which must be outside of the Music Department. Elective seminars should be selected in consultation with the student's faculty adviser.

Electives in the Music Department might include an additional course from the MUSC 203 Performance Practice series, an additional course from the MUSC 253 series, or an additional course from the MUSC 254 series.

Elective course options also include the following seminars:

MUSC 201	History of Music Theory from the Greeks Through Rameau	5
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MUSC 202	Tonal and Posttonal Analysis	5
MUSC 228	Techniques of Modernity and Aesthetic Formations	5

Fourth Quarter Research Paper

Ph.D. students entering the program with a bachelor's degree are required to submit a research paper by the beginning of the fourth quarter in residence, which will be revised that quarter under the supervision of the student's faculty adviser, and will be evaluated at the end of the quarter by the adviser and an additional faculty member. Students whose paper is assessed as unsatisfactory will not be allowed to continue in the Ph.D. program.

Students entering the Ph.D. program with a master's degree are required to complete following courses:

Three courses from the MUSC 203 Performance Practice series:

MUSC 203A	Performance Practice in the Middle Ages	5
MUSC 203B	Performance Practice in the Renaissance	5
MUSC 203C	Performance Practice in the Baroque	5
MUSC 203D	Performance Practice in the Classic Period	5
MUSC 203E	Performance Practice in the Romantic Period	5
MUSC 203F	Performance Practice in the 20th Century	5
MUSC 203G	Concepts, Issues, and the Practice of Ethnomusicology	5
MUSC 203H	Area Studies in Performance Practice	5

Two courses from the MUSC 253 series

MUSC 253A	Historical Perspectives in Musicology and Ethnomusicology	5
MUSC 253B	Rhythm, Time, and Form	5
MUSC 253C	Music and Discourse	5
MUSC 253D	Issues in the Ethnography of Music	5

Three courses from the MUSC 254 series

MUSC 254C	Performativity and Music	5
MUSC 254D	Organology and Acoustics	5
MUSC 254E	Asian Resonances in 20th-Century American and European Music	5
MUSC 254J	Jazz Historiography	5
MUSC 254K	Music, Gender, and Sexuality	5
MUSC 254L	John Cage: Innovation, Collaboration, and Performance Technologies	5
MUSC 254M	Music in San Francisco, 1850-1950	5
MUSC 254N	Cruising the Postcolony	5
MUSC 254O	Historiography of American Music	5

MUSC 254R	Research Design and Grant Writing for Music Scholars	5
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Plus the following course during each quarter of residence:

MUSC 252	Current Issues Colloquium
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Students must enroll in MUSC 252, Current Issues Colloquium, until advancing to candidacy.

Plus the following course:

MUSC 299	Thesis Research	5
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Elective Requirement

Students entering the Ph.D. program with a master's degree must take one elective graduate seminar from outside the Music Department. This seminar should be selected in consultation with the student's faculty adviser.

Foreign Language Requirements

Current skill in reading and comprehension of a relevant foreign language must be demonstrated by:

1. Satisfactory completion of level 3 of a foreign language at UCSC, preferably in the first year of the program; or
2. Submission of an official transcript documenting successful completion of one year of university-level foreign language at another institution (equivalent to level 3 at UCSC); or
3. Passing a foreign language proficiency examination administered by the Music Department in French, Spanish, German, Italian, or Russian. (This test requires translation of a passage of at least 600 words with no resources other than a dictionary to be completed in 1.5 hours.)
4. For languages other than French, Spanish, German, Italian, or Russian, the department may accept completion of an online course as fulfilling the requirement if the student can prove equivalency to a level 3 course at UCSC. The graduate committee will determine whether or not to accept any such course.

With approval of the primary adviser, students whose emphasis is algorithmic composition may complete three quarters or one year of university-level instruction in computer programming in lieu of the foreign language requirement.

In addition, Ph.D. students are required during their first year of enrollment to demonstrate proficiency in a second foreign language relevant to their area of interest.

Knowledge of languages not offered at UCSC must be demonstrated as determined by the Music Department's graduate committee. Graduate Division policy states that the language requirement must be completed prior to taking the qualifying examination.

Teaching Requirements

Pre-Qualifying Requirements

Pre-qualifying Reviews

At the end of the first year of study, all students accepted into the Ph.D. program will submit a brief report on work completed during that year. This report will inform a consideration by the music faculty of the student's status in the graduate program. Faculty will offer comments and suggestions to be communicated to the student either directly or through the student's adviser. If progress is minimal, faculty reserves the right to terminate a student's enrollment in the program.

Qualifying Examination

Advancement to candidacy is contingent upon passing both written and oral examinations. The written qualifying examination will test knowledge absorbed through the two years of coursework as well as material in the student's field of concentration. The oral examination will focus on the previously completed written examinations well as the student's developed expertise in her/his chosen specialization. Students must be registered in the quarter in which they take their qualifying examination.

The examinations will normally be administered at the end of year 3 for students entering with a bachelor's degree, and at the end of year 2 for students entering with a master's degree.

Advancement to candidacy will be granted after successful completion of the written and oral examinations, acceptance of the dissertation reading committee form, satisfactory completion of coursework and the foreign-language requirement, and the payment of the necessary fees.

Letter Grade Policy

Graduate students must take all core courses for a letter grade. These courses include the following: MUSC 200, MUSC 201, MUSC 202, MUSC 203A-H, MUSC 206A-D, MUSC 219, MUSC 220, MUSC 253A-D, and MUSC 254A-M. Grades of C or D do not satisfy any course requirement for a music graduate degree.

Independent study courses (MUSC 261, MUSC 265, MUSC 295, MUSC 297, MUSC 298, and MUSC 299) and the colloquium course (MUSC 252) may be taken with the Satisfactory/Unsatisfactory grade option.

Non-Terminal Master's Degree

Students who entered the Ph.D. program with a bachelor's degree may apply for the M.A. degree after completion of a minimum of five quarters in residence, evidence of the completion of the equivalent of one year of a foreign language at UCSC, the fourth-quarter research paper, and the following courses: MUSC 200, one course from the MUSC 203 series, MUSC 252 each quarter in residence, one course each from the MUSC 253 and MUSC 254 seminar series, two elective graduate seminars (one of which may be outside of the Music Department), and MUSC 297.

Dissertation

Dissertation

To satisfy requirements for the degree, a student must complete a dissertation and present a related formal lecture or lecture-recital. The student will develop a dissertation prospectus, which will be due six months after advancement to candidacy. Guidelines for the format and content of the prospectus can be found on the Music Department web site. The dissertation must embody substantial and original scholarly work based on a clearly distinguishable contemporary or historical music-cultural tradition, in any music-culture(s) of the world in which the UCSC program offers expertise. The public lecture or performance must demonstrate the student's grasp of the pertinent music-cultural performance tradition or music-cultural and/or music-historical concepts.

Dissertation Preparation Course Requirements

Students preparing for the dissertation should complete at least one quarter of MUSC 299, Thesis Research, with the faculty adviser.

Dissertation Defense

The final examination will be an oral defense of the dissertation open to the university faculty.

Successful completion of this examination will be determined by a majority vote of the dissertation reading committee.

Additional information about the program, including application and admission, is available from the Division of Graduate Studies and on the department website.

Academic Progress

For more information about maintaining academic good standing, students should consult the Academic Requirements and Standards section of the Division of Graduate Studies Handbook.

Applying for Graduation

For more information on applying for graduation, students should make an appointment with the Graduate Program adviser and consult UCSC's Graduate Division Handbook.

CONTEMPORARY PRACTICES CONCENTRATION MODULE COURSE LIST

Courses by Module

Contemporary Practices Modules

In addition to the core course requirements for the Music Bachelor of Arts degree, students in the Contemporary Practices concentration must complete three modules, relating to cross-cultural themes and genres.

Each module consists of:

- a lower-division MUSC 11, MUSC 80, or MUSC 81-series course specific to each module (three total)
- an upper-division MUSC 150 or equivalent (theory/composition-based) course specific to each module (three total)
- two quarters of performing ensembles or performance practice workshops specific to each module (six total). Most ensemble/performance practice courses may be repeated for credit.

Global Art Musics

Lower-Division Courses

MUSC 11A	Introduction to Western Classical Music	5
MUSC 11B	Introduction to Jazz	5
MUSC 80X	Music of India	5

Upper-Division Courses

MUSC 150A	Music Analysis for Performers	5
MUSC 150C	Special Topics in Music Theory: Tonal Counterpoint	5
MUSC 150I	Special Topics in Music Theory: Hindustani Music	5
MUSC 150T	Post Tonal Analysis	5

Ensemble/Performance Practice

MUSC 1C	University Concert Choir	2
MUSC 2	University Orchestra	2
MUSC 5A	West Javanese Gamelan Ensemble: Beginning	2
MUSC 5B	West Javanese Gamelan Ensemble: Intermediate	2
MUSC 5C	West Javanese Gamelan Ensemble: Advanced	2
MUSC 8A	Beginning Balinese Gamelan	2
MUSC 8B	Advanced Balinese Gamelan	2
MUSC 9	Wind Ensemble	2
MUSC 54	North Indian Music Workshop	2
MUSC 55	Rhythms of North India	2
MUSC 55A	Intermediate Rhythms of North India	2
MUSC 163	Early Music Ensemble	2
MUSC 166	Chamber Singers	2
MUSC 168	Experimental Music Ensemble	2

Experimental and Contemporary Musics

Lower-Division

MUSC 80C	History, Literature, and Technology of Electronic Music	5
MUSC 80H	The Hollywood Musical	5
MUSC 80K	Sound in Art, Science, and the Environment	5
MUSC 80L	Artificial Intelligence and Music	5
MUSC 80M	Film Music	5
MUSC 80N	Music of the Grateful Dead	5
MUSC 80O	Music, Politics, and Protest	5

MUSC 80P	Popular Music in the United States	5
MUSC 80R	Music in the Digital Age	5
MUSC 80V	The Music of the Beatles	5
MUSC 81A	Survey of Rap and Hip Hop Music	5
MUSC 81C	Global Popular Music	5
MUSC 81H	The Golden Age of Hip Hop	3
MUSC 81T	Fundamentals of Music Technology	2

Upper-Division

MUSC 105I	Improvisation and Collaborative Practices in the 20th Century	5
MUSC 111B	Seminar in Jazz Analysis	5
MUSC 123	Electronic Sound Synthesis	5
MUSC 124	Intermediate Electronic Sound Synthesis	5
MUSC 125	Advanced Electronic Sound Synthesis	5
MUSC 150P	Special Topics in Music Theory: 20th-Century Popular Song	5
MUSC 150R	Field Recording: Mapping and Composing Sound, Identity, and Place	5
MUSC 150S	Focus on Spontaneous Composition	5
MUSC 150T	Post Tonal Analysis	5
MUSC 150X	Theoretical Practices of American Music	5

Ensemble/Performance Practice

MUSC 3	Large Jazz Ensemble	2
MUSC 58	Songwriting Craft and Practice	5
MUSC 80Z	Laptop Music	5
MUSC 129	Live Electroacoustic Music Ensemble	2
MUSC 164	Jazz Ensembles	2
MUSC 167	Workshop in Electronic Music	2
MUSC 167R	Recording Workshop	2
MUSC 168	Experimental Music Ensemble	2
MUSC 267	Workshop in Computer Music and Visualization	2

Spontaneous Composition and Improvisation**Lower-Division**

MUSC 11B	Introduction to Jazz	5
MUSC 11D	Introduction to World Music	5
MUSC 80F	Music in Latin American Culture: Regional Traditions	5
MUSC 80Q	A Survey of African Music	5
MUSC 80X	Music of India	5
MUSC 81E	Music and Resilience in Latin America	5
MUSC 81J	Jazz Mirror of Global Interconnection	5
MUSC 81M	Chicano/Latino Music in the United States	5

Upper-Division

MUSC 105I	Improvisation and Collaborative Practices in the 20th Century	5
MUSC 111B	Seminar in Jazz Analysis	5
MUSC 150I	Special Topics in Music Theory: Hindustani Music	5
MUSC 150S	Focus on Spontaneous Composition	5
MUSC 174	Intermediate Spontaneous Composition and Improvisation	5
MUSC 175	Jazz Theory II	5
MUSC 203B	Performance Practice in the Renaissance	5

Ensemble/Performance Practice

MUSC 3	Large Jazz Ensemble	2
MUSC 5A	West Javanese Gamelan Ensemble: Beginning	2
MUSC 5B	West Javanese Gamelan Ensemble: Intermediate	2
MUSC 5C	West Javanese Gamelan Ensemble: Advanced	2
MUSC 8A	Beginning Balinese Gamelan	2
MUSC 8B	Advanced Balinese Gamelan	2
MUSC 10	Central Asian Ensemble	2
MUSC 12	Mariachi Ensemble	2
MUSC 12B	Mexican Folklorico Music and Dance	2
MUSC 54	North Indian Music Workshop	2
MUSC 55	Rhythms of North India	2
MUSC 55A	Intermediate Rhythms of North India	2
MUSC 57	Survey of Jazz Guitar Styles	2
MUSC 74	Spontaneous Composition/Improvisation I	5
MUSC 75	Jazz Theory I	5
MUSC 164	Jazz Ensembles	2
MUSC 174	Intermediate Spontaneous Composition and Improvisation	5
MUSC 175	Jazz Theory II	5
MUSC 203H	Area Studies in Performance Practice	5

GLOBAL MUSICS CONCENTRATION MODULE COURSE LIST

Courses by Module**Global Musics Modules**

In addition to the core course requirements for the Music Bachelor of Arts degree, students in the Global Musics concentration complete three modules, relating to geographical areas, themes, and genres.

Each module consists of:

- a lower-division MUSC 11, MUSC 80, or MUSC 81-series course specific to each module (three total)
- an upper-division MUSC 101, MUSC 105, MUSC 150, or MUSC 180 course specific to each module (three total)
- two quarters of performing ensemble or performance practice workshop specific to each module (six total). Courses may be repeated.

Africa and the Americas

Lower-Division History and Culture

MUSC 11B	Introduction to Jazz	5
MUSC 80F	Music in Latin American Culture: Regional Traditions	5
MUSC 80Q	A Survey of African Music	5
MUSC 81E	Music and Resilience in Latin America	5
MUSC 81J	Jazz Mirror of Global Interconnection	5
MUSC 81M	Chicano/Latino Music in the United States	5

Upper-Division History and Culture or Theory

MUSC 105C	Folk and Traditional Music in California	5
MUSC 150S	Focus on Spontaneous Composition	5
MUSC 180B	Studies in World Musics: Africa and the Americas	5

Performance Practice

MUSC 12	Mariachi Ensemble	2
MUSC 12B	Mexican Folklorico Music and Dance	2
MUSC 74	Spontaneous Composition/Improvisation I	5
MUSC 158	South African Music Ensemble	2
MUSC 158	South African Music Ensemble	2
MUSC 174	Intermediate Spontaneous Composition and Improvisation	5
MUSC 203H	Area Studies in Performance Practice	5

Asia

Lower-Division History and Culture

MUSC 11D	Introduction to World Music	5
MUSC 80A	Music of the Silk Road	5
MUSC 80X	Music of India	5

Upper-Division History and Culture or Theory

MUSC 150I	Special Topics in Music Theory: Hindustani Music	5
MUSC 180A	Studies in World Musics: Asia and the Pacific	5
MUSC 180C	Studies in World Musics: Central Asia	5

Performance Practice

MUSC 5A	West Javanese Gamelan Ensemble: Beginning	2
MUSC 5B	West Javanese Gamelan Ensemble: Intermediate	2
MUSC 5C	West Javanese Gamelan Ensemble: Advanced	2
MUSC 8A	Beginning Balinese Gamelan	2
MUSC 8B	Advanced Balinese Gamelan	2
MUSC 10	Central Asian Ensemble	2
MUSC 54	North Indian Music Workshop	2
MUSC 55	Rhythms of North India	2
MUSC 55A	Intermediate Rhythms of North India	2

Contemporary/Experimental Music

Lower-Division History and Culture

MUSC 80C	History, Literature, and Technology of Electronic Music	5
MUSC 80K	Sound in Art, Science, and the Environment	5
MUSC 80L	Artificial Intelligence and Music	5
MUSC 80P	Popular Music in the United States	5
MUSC 80R	Music in the Digital Age	5
MUSC 81A	Survey of Rap and Hip Hop Music	5
MUSC 81H	The Golden Age of Hip Hop	3
MUSC 81T	Fundamentals of Music Technology	2

Upper-Division History and Culture or Theory

MUSC 101C	History of Western Art Music	5
MUSC 105A	Music of the United States	5
MUSC 105I	Improvisation and Collaborative Practices in the 20th Century	5
MUSC 105P	The Piano	5
MUSC 150R	Field Recording: Mapping and Composing Sound, Identity, and Place	5

Performance Practice

MUSC 80Z	Laptop Music	5
MUSC 167	Workshop in Electronic Music	2
MUSC 167R	Recording Workshop	2
MUSC 168	Experimental Music Ensemble	2
MUSC 267	Workshop in Computer Music and Visualization	2

Europe

Lower-Division History and Culture

MUSC 11A	Introduction to Western Classical Music	5
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Upper-Division History and Culture or Theory

MUSC 101A	History of Western Art Music (Medieval, Renaissance, and Baroque)	5
MUSC 101B	History of Western Art Music	5
MUSC 101C	History of Western Art Music	5
MUSC 105E	Early Keyboard Music	5
MUSC 105M	Solo Song: from Monophony to Monody	5
MUSC 105O	Opera from Peri to Pergolesi	5
MUSC 105P	The Piano	5
MUSC 105Q	The String Quartet from Haydn to the Present	5
MUSC 105R	History of Russian Music	5
MUSC 150A	Music Analysis for Performers	5

Performance Practice

MUSC 1C	University Concert Choir	2
MUSC 2	University Orchestra	2
MUSC 9	Wind Ensemble	2
MUSC 163	Early Music Ensemble	2
MUSC 166	Chamber Singers	2

Jazz**Lower-Division History and Culture**

MUSC 11B	Introduction to Jazz	5
MUSC 81J	Jazz Mirror of Global Interconnection	5

Upper-Division History and Culture or Theory

MUSC 105A	Music of the United States	5
MUSC 105I	Improvisation and Collaborative Practices in the 20th Century	5
MUSC 111B	Seminar in Jazz Analysis	5
MUSC 203F	Performance Practice in the 20th Century	5

Performance Practice

MUSC 3	Large Jazz Ensemble	2
MUSC 74	Spontaneous Composition/Improvisation I	5
MUSC 75	Jazz Theory I	5
MUSC 164	Jazz Ensembles	2
MUSC 174	Intermediate Spontaneous Composition and Improvisation	5
MUSC 175	Jazz Theory II	5

Popular Music**Lower-Division History and Culture**

MUSC 11B	Introduction to Jazz	5
MUSC 80H	The Hollywood Musical	5
MUSC 80I	Music of Modern Israel	5
MUSC 80M	Film Music	5
MUSC 80N	Music of the Grateful Dead	5
MUSC 80O	Music, Politics, and Protest	5
MUSC 80P	Popular Music in the United States	5
MUSC 80V	The Music of the Beatles	5

MUSC 81A	Survey of Rap and Hip Hop Music	5
MUSC 81C	Global Popular Music	5
MUSC 81H	The Golden Age of Hip Hop	3
MUSC 81R	The 1970's: A Decade in Rock	3

Upper-Division History and Culture or Theory

MUSC 105I	Improvisation and Collaborative Practices in the 20th Century	5
MUSC 111B	Seminar in Jazz Analysis	5
MUSC 123	Electronic Sound Synthesis	5
MUSC 124	Intermediate Electronic Sound Synthesis	5
MUSC 125	Advanced Electronic Sound Synthesis	5
MUSC 150P	Special Topics in Music Theory: 20th-Century Popular Song	5

Performance Practice

MUSC 3	Large Jazz Ensemble	2
MUSC 12	Mariachi Ensemble	2
MUSC 80Z	Laptop Music	5
MUSC 164	Jazz Ensembles	2
MUSC 167R	Recording Workshop	2
MUSC 203H	Area Studies in Performance Practice	5

World Musics**Lower-Division History and Culture**

MUSC 11B	Introduction to Jazz	5
MUSC 11D	Introduction to World Music	5
MUSC 80A	Music of the Silk Road	5
MUSC 80F	Music in Latin American Culture: Regional Traditions	5
MUSC 80T	Mizrach: Jewish Music in the Lands of Islam	5
MUSC 80X	Music of India	5
MUSC 81C	Global Popular Music	5
MUSC 81E	Music and Resilience in Latin America	5
MUSC 81I	Music of Indonesia	5
MUSC 81J	Jazz Mirror of Global Interconnection	5
MUSC 81M	Chicano/Latino Music in the United States	5

Upper-Division History and Culture or Theory

MUSC 105C	Folk and Traditional Music in California	5
MUSC 111B	Seminar in Jazz Analysis	5
MUSC 150I	Special Topics in Music Theory: Hindustani Music	5
MUSC 180A	Studies in World Musics: Asia and the Pacific	5
MUSC 180B	Studies in World Musics: Africa and the Americas	5
MUSC 180C	Studies in World Musics: Central Asia	5

Performance Practice

MUSC 3	Large Jazz Ensemble	2
MUSC 5A	West Javanese Gamelan Ensemble: Beginning	2
MUSC 5B	West Javanese Gamelan Ensemble: Intermediate	2
MUSC 5C	West Javanese Gamelan Ensemble: Advanced	2
MUSC 8A	Beginning Balinese Gamelan	2
MUSC 8B	Advanced Balinese Gamelan	2
MUSC 10	Central Asian Ensemble	2
MUSC 12	Mariachi Ensemble	2
MUSC 12B	Mexican Folklorico Music and Dance	2
MUSC 54	North Indian Music Workshop	2
MUSC 55	Rhythms of North India	2
MUSC 55A	Intermediate Rhythms of North India	2
MUSC 158	South African Music Ensemble	2
MUSC 163	Early Music Ensemble	2
MUSC 164	Jazz Ensembles	2
MUSC 203H	Area Studies in Performance Practice	5

Performance, Play, and Design

J106 Theater Arts Center
 (831) 459-2974
 theater@ucsc.edu
 http://theater.ucsc.edu

PROGRAMS OFFERED

(p. 94) Art and Design: Games and Playable Media B.A. (p. 88)

Theater Arts B.A. (p. 94)

Theater Arts Minor (p. 98)

Dance Minor (p. 100)

Theater Arts M.A. (p. 101)

OTHER PROGRAMS OF INTEREST

Computer Science: Computer Game Design B.S. (p. 448)

The Performance, Play, and Design Department is a diverse group of scholars/artists united by a passionate belief in the value of the performing arts. Based on respect for the classical theater of all cultures, combined with a determination to challenge tradition and fashion, we educate our students in the history, theory, and practice of theater and dance to address fundamental issues by using the tools of body, voice, mind, and imagination. Seeking to attain the highest levels of intellectual and artistic integrity, and with a commitment to cultural diversity, we serve the research mission of UC Santa Cruz, our audiences, and the students who will shape the theater of the future.

UNDERGRADUATE PROGRAM

The Performance, Play, and Design Department combines drama, dance, critical studies, and theater design/technology to offer students an intensive program of theater as a unified field. The program stresses the inter-relation of all disciplines as essential to the successful practice of the theater arts in the 21st century. Graduates of the UCSC program typically pursue careers in professional theater and dance companies, in film and television, and in teaching at all levels—from university to high school to grade school. Many students go on to higher degrees at prestigious national programs. Others engage in careers in arts, administration, dramatic writing, and related fields.

The lower-division curriculum requires a range of practical work in the various concentrations and an interdisciplinary exposure to critical and historical studies. At the upper-division level, students are given the opportunity to focus on one or more areas of interest in limited-enrollment studios. At the same time, they are asked to expand their theoretical perspectives through confrontation with performance theory and focused coursework in critical studies. The impact of digital and new media on theater is also integrated into the curriculum.

A wealth of production opportunities is available to students. This includes major productions directed by faculty or distinguished visiting artists each quarter, productions directed or choreographed by students, and faculty-directed workshops. Undergraduate students are also given the opportunity to see their own writing, choreography, or developing concepts put into production in department-sponsored productions and annual festivals of student work. Although majors are given preference in studio courses, most courses and productions welcome non-majors as well. Opportunities to study and perform non-Western as well as Euro-American traditions are also a significant part of the program.

The stage and studio spaces available to students of theater arts allow for a breadth of training and performance opportunities. The Theater Arts Center contains a 500-seat thrust stage; a state-of-the-art experimental theater; a 200-seat proscenium theater; acting, directing, design and dance studios; costume, scene, and properties shops; a sound recording room; and a computer lab. Also, located at the base of the campus is our 150-seat Barn Theater.

Library holdings in theater literature and history are extensive, including a large slide collection and dance video archives; journals in current theater, design/technology, and dance; and recordings, films, videotapes, and CD-ROMs.

GRADUATE PROGRAM

The Master of Arts degree combines intellectually rigorous coursework with challenging artistic practice. Like our undergraduate curriculum, our graduate program integrates the study of ancient and modern theater texts and practices, and it examines diverse approaches to performance. It encourages collaboration, initiative, and cross-disciplinary thinking.

ART AND DESIGN: GAMES AND

PLAYABLE MEDIA B.A.

Information and Policies

Introduction

The Art and Design: Games and Playable Media (AGPM) Bachelor of Arts (B.A.) degree at UC Santa Cruz focuses on the creation of novel game systems, spaces, and configurations that can produce broad ranges of player experiences, for a wide variety of purposes. It does this through:

- courses in related theory, history, and critical interpretation;
- courses that take a practice-based approach to experimental game creation;
- courses that provide a foundation in working with game media forms;
- courses that provide a foundation in working with game technical materials.

This degree complements the Computer Science: Computer Game Design (CSGD) Bachelor of Science (B.S.), which focuses particularly on the technical aspects of game development. The B.A. focuses more on experience design (in particular) as well as on history, theory, and media creation—while still taking advantage of courses developed for the B.S. and creating a shared community with those students.

Students in the AGPM major learn to understand game design as an art in and of itself, positioned within the context of a number of more disciplinary approaches. Furthermore, students understand game design as a practice of creation, within a much larger and deeper social and historical context.

The AGPM B.A. in the Arts Division ensures that students have the needed programming skills— and, equally importantly, that they meld such technical skills with critical and historical understanding, which is essential for the production of socially-conscious, inclusive, and emotionally engaging games.

Upper-division studio courses require coursework to be completed on computers. All students in the B.A. program are strongly encouraged to own a laptop computer. This expense is separate from the cost of tuition and other fees. There is not really a particular laptop that we recommend for AGPM since it really depends on what courses you take. Please take a look at the linked system requirement information below for the various programs that you might use when taking our courses:

- [Adobe Photoshop](#) (other [Adobe Creative Cloud programs](#))
- [Autodesk Maya](#)
- [Blender](#)
- [Unity](#)

While pursuing coursework in the major, all students are to encouraged to build portfolios that showcase their growing body of work, with an emphasis on material from courses such as ARTG 80I, CMPM 80K, and ARTG 120, and CMPM 120.

AGPM Program Values

As a community we are committed to equity, inclusion, social and environmental justice. As an intersectional feminist program, we recognize this is a process that must be grounded in shared leadership and radical gentleness.

In our work as students, faculty, and staff we embody the values of honesty, kindness, and critical thinking while maintaining a nurturing environment with a specific focus on health and well-being, critical consciousness, and growth.

We are committed to sustaining a program that is pro-LGBTQ+, anti-racist, and anti-oppression. This work requires a proactive approach to sustainability and accountability— and ultimately relies on our shared experience and solidarity.

Academic Advising for the Program

Please refer to the AGPM advising page for the most up-to-date information on drop-in hours and appointments.

You can reach the AGPM office via phone by calling (831) 459-1554.

If you are a prospective junior transfer hoping to join AGPM, please be sure to carefully read the section below titled Transfer Information and Policy.

Getting Started in the Major

Students interested in entering the Art & Design: Games & Playable Media (AGPM) program as frosh can do so as long as they are admitted into UC Santa Cruz.

Incoming frosh *do not* need to satisfy any programming or art requirements prior to arriving at UCSC.

While frosh may not need to satisfy specific requirements, they are urged to make games—using any materials, from Javascript to cardboard—and carefully study game systems. Developing an arts practice in any medium is also helpful, including drawing, writing, music, sculpture, filmmaking, and others. Finally, deepening your understanding of technology is good preparation, including computer programming, participating in maker groups, or whatever else grabs your interest.

Program Learning Outcomes

Students who earn a B.A. in Art and Design: Games and Playable Media gain the skills, knowledge, and understanding that enable them to:

Program Learning Outcomes (PLO)

PLO 1: Demonstrate understanding of the connections between technical commitments and game system design, on one hand, and player experience and cultural communication goals, on the other.

PLO 2: Demonstrate the ability to define, develop, and communicate artistically innovative game ideas—situated historically and employing the methods of multiple art practices.

PLO 3: Demonstrate the ability to design and build a technical system in response to an artistic goal for audience experience

that employs a fundamental understanding of algorithms and data structures.

PLO 4: Demonstrate an understanding of game history and interpretation sufficient to do independent research on a topic, identify relevant games and secondary literature, think critically about a particular games-related topic, and make a convincing, research-based argument about games.

PLO 5: Demonstrate the ability to collaboratively plan, organize, and execute complex, team-oriented projects, using appropriate communication and coordination techniques.

PLO 6: Demonstrate the ability to effectively use techniques for understanding how players experience a game system, and to compare this with a project's artistic goals—then successfully iterate and revise project shape, scope, and function based on external feedback and personal/team constraints.

Major Qualification Policy and Declaration Process

Major Qualification

Prior to declaring the AGPM major, students must complete the following Major Qualification courses with a grade of C or better (these courses can also be taken as Pass/No Pass):

ARTG 80H	Critical History of Digital Games	5
ARTG 80I	Foundations of Play	5
CMPM 80K	Foundations of Video Game Design	5
CSE 30	Programming Abstractions: Python	7

Note: CSE 30 has MATH 3 (or higher) and CSE 20 as prerequisites. Grades in these courses are not considered for qualification.

Appeal Process

We do not have a GPA requirement or appeal process for the AGPM major. As long as you complete all of our major qualification courses with a passing grade, you will be able to declare our major. If you have any questions, please reach out to the AGPM advisor.

How to Declare a Major

Students should submit a petition to declare as soon as they complete the major qualification requirements or reach their declaration deadline quarter (whichever comes first).

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed major qualification (MQ) courses.

All students declare via the the [AGPM Major Declaration Form](#). Students should wait until they have received passing grades in all major qualification courses before submitting.

- If a student will not complete all the major qualification courses by the campus declaration deadline, they submit the same form and indicate which requirements are incomplete. Their submission will be reviewed by the department as an attempt to declare via appeal.

- Students pursuing a **double major or major/minor plan** submit the online form above, and then additionally submit a PDF [petition for major declaration](#) form and send it to agpmadvising@ucsc.edu with the subject line: "Your Name - AGPM Double Major or Minor Declaration." Students should have already created an AGPM academic plan with the advisor prior to declaring.

Transfer Information and Policy

Transfer Admission Screening Policy

In preparation for transfer to AGPM, students are required to demonstrate proficiency in programming, visual art, and game design.

The following courses or their equivalents are required prior to transfer, by the end of the spring term for students planning to enter in fall:

Programming Requirement

Complete the following course or its equivalent:		
CSE 30	Programming Abstractions: Python	7

A minimum GPA of 2.0 (C) required in the course listed above.

Students entering UCSC through fall 2021 also have the option to use a course articulated to CSE 15/CSE 15L (previously offered for this requirement as CMPS 12B/M, Introduction to Data Structures).

Lower-Division Art and Design Requirement

Complete one of the following courses or its equivalent:

ART 15	Introduction to Drawing for the Major	5
ART 20	Any course in the ART 20 series	
ARTG 80G	Visual Communication and Interaction Design	5
ARTG 80H	Critical History of Digital Games	5
ARTG 80I	Foundations of Play	5
ARTG 91	Introduction to Game Art Production	5
CMPM 25	Introduction to 3D Modeling	5
CMPM 26	Introduction to 3D Animation	5
CMPM 80K	Foundations of Video Game Design	5
FILM 20P	Introduction to Production Technique	5
MUSC 1C	University Concert Choir	2
MUSC 2	University Orchestra	2
MUSC 3	Large Jazz Ensemble	2
MUSC 5A	West Javanese Gamelan Ensemble: Beginning	2

MUSC 5B	West Javanese Gamelan Ensemble: Intermediate	2
MUSC 5C	West Javanese Gamelan Ensemble: Advanced	2
MUSC 6	Classical Guitar Ensemble	2
MUSC 8A	Beginning Balinese Gamelan	2
MUSC 8B	Advanced Balinese Gamelan	2
MUSC 9	Wind Ensemble	2
MUSC 10	Central Asian Ensemble	2
THEA 10	Introduction to Theater Design and Technology	5
THEA 14	Drawing	5
THEA 15	Special Topics in Textiles	5
THEA 17	Costume Construction	5
THEA 18	Drafting for Theatrical Production	5
THEA 19	Design Studio: Lighting Studio A	5
THEA 20	Introductory Studies in Acting	5
THEA 21	Acting Studio I: Psychological Realism	5
THEA 22	Indonesian Dance and Drama	5
THEA 30	Introduction to Dance Theory and Technique	5
THEA 31C	Dance Studio I: Contemporary Dance Theory and Technique	5
THEA 33C	Dance Studio I	5
THEA 36	Introduction to Dance Composition	5
THEA 37	African Dance	5
THEA 40	Introduction to Directing	5
THEA 50	Fundamentals of Theater Production	2
THEA 80Z	Indian Dance	5

Additional Suggested Courses

In addition, the following courses are recommended prior to transfer to ensure timely graduation:

- Community college courses that are articulated for credit with courses in the Foundational Courses and Lower-Division Arts Requirements and Electives courses listed in the Requirements and Planners tab.

Transfer students who meet the requirements above and complete general education requirements will be able to complete the major in two years as shown in the academic plan in the Planners section of the Requirements and Planners tab on this page. Because of the number of credits required by the B.A., transfer students who have general education requirements remaining may need to take summer session courses and/or additional courses over the academic year to allow graduation in two years.

Prospective students are encouraged to prioritize required and recommended major preparation, and may additionally complete courses that articulate to UC Santa Cruz general education requirements as time allows.

Getting Started at UCSC as a Transfer Student

Transfer students are strongly advised to attend a UCSC Summer Orientation session for transfer students. Transfer students should consult with an AGPM academic advisor prior to enrolling in classes to determine their status and to begin the declaration of major process as soon as possible.

Please see a recommended academic plan for junior transfer students in the Planners section of the Requirements and Planners tab on this page.

Letter Grade Policy

All courses used to satisfy any of the Art and Design: Games and Playable Media major requirements can be taken for a letter grade or as Pass/No Pass. This includes both introductory lower-division and advanced upper-division requirements, and with the major qualification courses. A grade of "Pass" is equivalent to meeting the requirement of "C or better" in the Major Qualification policy.

[Optional Catchall]

Course Substitution Policy

Students are able to petition a course to count as a substitute for any given **elective requirement** via the AGPM Course Substitution Petition form. Once submitted, requests are reviewed by the program chair. After they come to a decision, the AGPM advisor will reach out to the student and let them know whether their petition was approved or not.

Double Majors and Major/Minor Combinations Policy

Students may choose to do a double major or minor along with the AGPM program, but are advised that AGPM has a high number of course requirements. As a result students may be required to petition for a later graduation date in order to complete a double major or minor.

Study Abroad

Honors

[Optional Catchall]

Requirements and Planners

Course Requirements

The AGPM major requires a minimum of nine lower-division and 11 upper-division courses in residence and satisfaction of the senior comprehensive requirement. The elective options for the major are grouped according to a student's desired career path at the AGPM Class Cluster website.

Lower-Division Courses

Foundational Courses

Complete the following seven courses:

ARTG 80H	Critical History of Digital Games	5
ARTG 80I	Foundations of Play	5

CMPM 80K	Foundations of Video Game Design	5	THEA 33C	Dance Studio I	5
CSE 20	Beginning Programming in Python	5	THEA 36	Introduction to Dance Composition	5
CSE 30	Programming Abstractions: Python	7	THEA 37	African Dance	5
CMPM 35	Data Structures for Interactive Media	5	THEA 40	Introduction to Directing	5
FILM 80V	Video Games as Visual Culture	5	THEA 50	Fundamentals of Theater Production	2
			THEA 80Z	Indian Dance	5

Notes:

- CSE 30 has computer science and mathematics prerequisites.
- Students with prior programming experience, AP credit, or who test out of CSE 20 can start with CSE 30.

Lower-Division Arts Elective

Complete one lower-division course from the following:

(Check with the Art Department and the General Catalog for restrictions or prerequisites on art courses.)

ART 10D	2D Foundation	5	THEA 120	Game Development Experience	5
ART 10E	3D Foundation	5	ARTG 120	Game Design Experience	5
ART 10F	4D Foundation	5	ARTG 170	Game Design Studio I	5
ART 20L	Introduction to Drawing	5	ARTG 171	Game Design Studio II	7
ARTG 80G	Visual Communication and Interaction Design	5	ARTG 172	Game Design Studio III	7
ARTG 91	Introduction to Game Art Production	5			
MUSC 1C	University Concert Choir	2			
MUSC 2	University Orchestra	2			
MUSC 3	Large Jazz Ensemble	2			
MUSC 5A	West Javanese Gamelan Ensemble: Beginning	2			
MUSC 5B	West Javanese Gamelan Ensemble: Intermediate	2			
MUSC 5C	West Javanese Gamelan Ensemble: Advanced	2			
MUSC 6	Classical Guitar Ensemble	2			
MUSC 8A	Beginning Balinese Gamelan	2			
MUSC 8B	Advanced Balinese Gamelan	2			
MUSC 9	Wind Ensemble	2			
MUSC 10	Central Asian Ensemble	2			
MUSC 80L	Artificial Intelligence and Music	5			
THEA 10	Introduction to Theater Design and Technology	5			
THEA 14	Drawing	5			
THEA 15	Special Topics in Textiles	5			
THEA 17	Costume Construction	5			
THEA 18C	Drafting-Computer Aided	5			
THEA 19	Design Studio: Lighting Studio A	5			
THEA 20	Introductory Studies in Acting	5			
THEA 21	Acting Studio I: Psychological Realism	5			
THEA 22	Indonesian Dance and Drama	5			
THEA 30	Introduction to Dance Theory and Technique	5			
THEA 31C	Dance Studio I: Contemporary Dance Theory and Technique	5			

History of Art and Visual Culture Requirement

Complete any one 5-credit History of Art and Visual Culture (HAVC) course. This can be either a lower- or upper-division course.

Upper-Division Courses**Game Design Requirements**

Complete all the following courses:

CMPM 120	Game Development Experience	5
ARTG 120	Game Design Experience	5
ARTG 170	Game Design Studio I	5
ARTG 171	Game Design Studio II	7
ARTG 172	Game Design Studio III	7

Electives**Upper-Division Electives**

Click through to classes below and check with course home departments for availability, prerequisites, or enrollment restrictions. ART, CMPM and CSE courses may have restrictions or prerequisites. FILM courses have prerequisites and/or require an application, and are generally restricted to Film and Digital Media majors. MUSC courses are restricted to students in the electronic music minor.

Complete six courses from the following list:

ART 101	Introduction to Computer Programming for the Arts	5
ART 104	Digital Video	5
ART 106A	2D Animation	5
ART 106E	3D Modeling and Animation	5
ART 106O	2D Animation	5
ART 108	Activate Media! New Media Art Activism and Organizing	5
ARTG 118	Character Creation for Video Games	5
ARTG 129	Special Topics in Game Design	5
ARTG 129A	Special Topics in Game Design	5
ARTG 131	3D Game Art Production	5
ARTG 132	3D Character Rigging and Animation for Video Games	5
ARTG 134	Spectacular Play: Performance, Ritual, and Making a Scene IRL	5
ARTG 136	Digital Sculpting for Video Games	5

ARTG 137	Experimental Tabletop RPG Design	5
ARTG 138	Feminist Games	5
ARTG 140	Writing for Interactive Narrative	5
ARTG 141	Introduction to Virtual Reality	5
ARTG 145	Non-Digital Game Design	5
CMPM 25	Introduction to 3D Modeling	5
CMPM 26	Introduction to 3D Animation	5
CMPM 131	User Experience for Interactive Media	5
CMPM 146	Game AI	5
CMPM 147	Generative Design	5
CMPM 148	Interactive Storytelling	5
CMPM 150	Creating Digital Audio	5
CMPM 151	Algorithmic Music for Games	5
CMPM 163	Game Graphics and Real-Time Rendering	5
CMPM 176	Game Systems	5
CMPM 177	Creative Strategies for Designing Interactive Media	5
CMPM 178	Human-Centered Design Research	5
CMPM 179	Game Design Practicum	5
CSE 118	Mobile Applications	5
CSE 183	Web Applications	5
DANM 140	Introduction to 3D Printing, Laser Cutting, and More	5
DANM 219	Introduction to Electronics for Artmaking	5
DANM 220	Introduction to Programming for the Arts	5
FILM 170A	Fundamentals of Digital Media Production	5
FILM 171D	Social Information Spaces	5
FILM 173	Narrative Digital Media Workshop	5
FILM 177	Digital Media Workshop: Computer as Medium	5
FILM 179A	Special Topics in Animation	5
FILM 179B	Documentary Animation Workshop	5
FILM 189	Advanced Topics in Digital and Electronic Media Studies	5
MUSC 123	Electronic Sound Synthesis	5
MUSC 124	Intermediate Electronic Sound Synthesis	5
MUSC 125	Advanced Electronic Sound Synthesis	5
MUSC 167	Workshop in Electronic Music	2
THEA 104	Multimedia Authoring	5
THEA 114	Sound Design and Engineering for the Theater	5
THEA 117	Design Studio: Costume	5
THEA 124	Movement for Performers	5
THEA 139	Random: With a Purpose	5
THEA 157	Playwriting	5
THEA 159	Advanced Playwriting	5

Completion of CMPM 25 AND CMPM 26 counts as one upper-division elective.

Click through to individual class descriptions for availability, prerequisites, or enrollment restrictions.

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division disciplinary communication (DC) requirement. The DC requirement in Art and Design: Games and Playable Media is satisfied by completing:

ARTG 170	Game Design Studio I	5
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Comprehensive Requirement

Students satisfy the senior comprehensive requirement by receiving a passing grade in all three courses of the game design studio sequence (ARTG 170, ARTG 171, and ARTG 172). This sequence will meet in collaboration with CMPM 170, CMPM 171, and CMPM 172.

ARTG 170	Game Design Studio I	5
ARTG 171	Game Design Studio II	7
ARTG 172	Game Design Studio III	7

Planners

The following is a recommended academic plan for students to complete during their first two years as preparation for the AGPM major.

Art and Design: Games and Playable Media B.A. Planner

	Fall	Winter	Spring	Summer
1st (frosh)	ARTG 80I	CSE 20	CSE 30	
	^MATH 3, Precalculus	ARTG 80H	CMPM 80K	
2nd (soph)	CMPM 35	FILM 80V	HAVC elective	
		Lower-division arts elective**		
3rd (junior)	Upper-division elective 1	Upper-division elective 3	ARTG 120*	
	Upper-division elective 2	Upper-division elective 4	CMPM 120*	

4th (senior)	ARTG 170 Upper- division elective 5	ARTG 171 Upper- division electiv e 6	ARTG 172
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^ The math prerequisite for CSE 30 can be satisfied in any of the following ways: successfully passing MATH 3, MATH 11A, MATH 19A, AM 3, AM 11A/ECON 11A, or a score of 400 or higher on the mathematics placement examination.

* ARTG and CMPM 120 are also offered during the summer.

** We highly recommend that students enroll in ARTG 80G for their LD Arts Elective course.

In addition to the specific courses shown in the four-year planner, a student must complete courses satisfying the CC, ER, SI, SR, TA, PR and C (WRIT 2) general education requirements.

Transfer Students Planner

	Fall	Winter	Spring	Summer
1st (junior)	Lower- division arts elective **	Upper- division elective 1	CMP M 120*	
	ARTG 80H	CMPM 80K	ARTG 120*	
	ARTG 80I	FILM 80V	HAVC Electiv e	
2nd (senior)	ARTG 170	ARTG 171	ARTG 172	
	Upper- division elective 2	Upper- division elective 4	Upper- divisio n electiv e 6	
	Upper- division elective 3	Upper- division elective 5		

The two-year planner assumes that a student has completed all general education requirements before transferring to UCSC.

THEATER ARTS B.A.

Information and Policies

Introduction

Academic Advising for the Program

General information about theater arts and dance degrees is available on the Theater Arts Department website. Students are also strongly encouraged to consult early with the Theater Arts Department advisor to create an academic plan for the major or a minor far in advance of declaration, as early as the summer before beginning at the university. Please use Slug Success to make an appointment. You may also contact the department advisor by emailing theater-ugradadv@ucsc.edu or calling (831) 459-2974.

Transfer students—please also see the How to Declare a Major and the Transfer Information and Policy sections below.

Program Learning Outcomes

Our program stresses dance, design, and drama as essential disciplines in the successful practice of theater arts in the contemporary world.

Graduates from the Theater Arts B.A. program should demonstrate the following:

1. Foundations of Performance. Students should be able to identify and apply basic theatrical techniques in dance, design, and drama.
2. Theatrical histories and theories. Students should be able to recognize and analyze performance works within the general culture and historical period that produced them.
3. Performance experience. Students should be able to translate theater arts concepts into performance, participating in any theatrical endeavor with the rigor, discipline, and imagination necessary to make a meaningful contribution.
4. Research proficiency. Students should be able to formulate personal research questions that expand their knowledge of theater arts, conducting independent research into the history and theory of at least one area of interest.
5. Creative practice. Students should be able to use theatrical practices and performance experiences to conceive, design, realize, and reflect on new performance projects.
6. Appreciation of diversity. Students should be able to recognize and appreciate a wide variety of approaches, cultures, and styles in both past and contemporary performance practice.
7. Communication and critical thinking. Students should be able to use critical vocabularies to communicate clearly about theater arts in written and oral forms.
8. Collaborative skills. Students should be able to work confidently and effectively in groups on a common project.

Major Qualification Policy and Declaration Process

Major Qualification

Transfer students—please see the How to Declare a Major and the Transfer Information and Policy sections below.

To declare the major no later than the major declaration deadline in their sixth term, as required by the university, students who start UC Santa Cruz as frosh must meet and make an academic plan with the Theater Arts Department academic advisor (make an advising appointment through Slug Success) and successfully completed three lower-division courses:

One course from:

THEA 61A	Ancient and Medieval Drama	5
THEA 61B	Drama from the Renaissance to the Modern Age	5
THEA 61C	The Birth of the Modern: Drama and Performance After the Renaissance	5

Plus two courses chosen from:

THEA 10	Introduction to Theater Design and Technology	5
THEA 30	Introduction to Dance Theory and Technique	5
Either this course		
THEA 20	Introductory Studies in Acting	5
or this course		
THEA 21	Acting Studio I: Psychological Realism	5

Either THEA 20 or THEA 21 may be used as one of the three courses taken for declaration eligibility (not both). THEA 20 is a non-audition course designed for students with little or no experience in acting. THEA 21 is appropriate for students with some acting experience and is admission-by-audition (audition requirements are listed when classes are published in the Schedule of Classes). Please speak with the department advisor for more information.

Appeal Process

Students who are informed that they are not eligible to declare the major may appeal this decision by submitting a letter to the department chair within 15 days from the date the notification was mailed. Within 15 days of receipt of the appeal, the department will notify the student and college of the decision. Students should submit their appeal via email to theater-ugradadv@ucsc.edu.

How to Declare a Major

To declare the theater arts major, minor or dance minor all students meet with the academic advisor to begin the declaration process by making an appointment (via Slug Success).

Students are also required to meet with a faculty advisor (assigned by the academic advisor) as part of the declaration process.

If non-course requirements remain incomplete by the campus deadline (in their sixth quarter for students admitted as frosh, and in their second quarter for transfer students), the student must be allowed to declare the major by the declaration deadline in their next academic term (excluding summer) without appeal.

Transfer students are encouraged to declare the major as soon as possible and may declare as soon as their first quarter on campus after meeting with the Theater Arts Department academic advisor (make an advising appointment through Slug Success). Transfer students may declare the theater arts major even if they have not completed any theater arts courses and must declare a major by the end of their second quarter, as required by the university. Transfer students should also read the notes in the Transfer Information and Policy section.

Transfer Information and Policy

Transfer Admission Screening Policy

Students planning to pursue the theater arts major are not required to audition, submit a portfolio, or complete specific major preparation courses for consideration of admission to UC Santa Cruz.

While not required for admission, transfer students are recommended to complete general education requirements (p. **Error! Bookmark not defined.**) before coming to UC Santa Cruz. Students may also complete courses that are articulated to UC Santa Cruz lower-division theater arts courses before coming to UC Santa Cruz. Please consult with the department advisor for more information.

Getting Started at UC Santa Cruz as a Transfer Student

Transfer students are strongly advised to consult with the Theater Arts Department academic advisor prior to enrolling in classes their first quarter (make an advising appointment through Slug Success, or email theater-ugradadv@ucsc.edu before you have access to that system).

Transfer students may petition to have equivalent lower-division courses taken at other schools count toward lower-division major or minor requirements and should always consult with the Theater Arts Department academic advisor as early as possible regarding this option.

As stated in the How to Declare a Major section, transfer students may declare the major at any time after coming to UC Santa Cruz and are encouraged to do so as soon as possible, even if they have not completed any theater arts courses. Transfer students entering as juniors must declare a major by the deadline in their second quarter, as required by the university.

Letter Grade Policy

This program does not have a letter grade policy outside the university's Pass/No Pass limit and minimum grade requirement (more information is available on the Pass/No Pass website).

[Optional Catchall]**Course Substitution Policy****Double Majors and Major/Minor Combinations Policy****Study Abroad**

There are many opportunities for students to study abroad, potentially fulfilling major or minor requirements. Credits earned through study abroad programs or off-campus programs are considered on a case-by-case basis by the department faculty. Please consult with the department academic advisor about this process.

It is important to learn about requirements and deadlines as early as possible from the Study Abroad/Global Learning office and then to carefully plan with department and college advisors. Some required courses at UC Santa Cruz are only offered in certain quarters, for example, and therefore careful planning is essential.

Please read more about study abroad opportunities on the Global Engagement website.

[Optional Catchall]**Requirements and Planners****Course Requirements**

The theater arts major requires seven lower-division courses, six credits of course THEA 50, and eight upper-division courses (inclusive of a senior seminar course, THEA 185). Majors may organize their studies around an area of interest in accordance with the requirements outlined below.

Credits earned via a study abroad program, such as the UC Education Abroad Program (EAP), or other off-campus programs are considered on a case-by-case basis by the department chair. Students should consult with their department and college advisors before planning studies outside of UC Santa Cruz. Please read more about study abroad opportunities on the Global Learning website.

Lower-Division Courses**One of the following courses:**

THEA 20	Introductory Studies in Acting	5
THEA 21	Acting Studio I: Psychological Realism	5

Plus all of the following courses:

THEA 10	Introduction to Theater Design and Technology	5
THEA 30	Introduction to Dance Theory and Technique	5
THEA 61A	Ancient and Medieval Drama	5
THEA 61B	Drama from the Renaissance to the Modern Age	5
THEA 61C	The Birth of the Modern: Drama and Performance After the Renaissance	5

Plus one lower-division 5-credit elective**Plus the following course (three times):**

THEA 50	Fundamentals of Theater Production	2
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NOTE: this 2-credit course must be taken three times for a total of six credits. Students are highly encouraged to complete all six required credits of THEA 50 before their last two quarters, and to contact the department advisor early to learn about the unique enrollment process for the class.

Plus one course

One lower-division 5-credit elective course.

Upper-Division Courses

Eight upper-division courses must be taken as part of the major, as specified here:

The following course:

THEA 160	Dramatic Theories	5
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Plus two studio courses chosen from:

THEA 103	Design Concept Development	5
THEA 106	Digital Illustration	5
THEA 114	Sound Design and Engineering for the Theater	5
THEA 115A	Design Studio: Scenic Design	5
THEA 115B	Design Studio: Scenic Design B	5
THEA 117	Design Studio: Costume	5
THEA 117A	Advanced Costume Construction	5
THEA 118	Design Studio: Scene Painting	5
THEA 119	Design Studio: Lighting Studio B	5
THEA 120	Voice and Movement for Performers	5
THEA 121	Acting Studio II: Shakespeare	5
THEA 123	Acting and Shakespeare	5
THEA 124	Movement for Performers	5
THEA 126	Acting Studio III	5
THEA 126M	The Meisner Technique: A Practical Exploration	5
THEA 131A	Dance Studio II: Asian or Asian Diasporic Practice	5
THEA 131C	Dance Studio II: Advanced Contemporary Forms and Practices	5
THEA 135	Choreography I	5
THEA 136	Choreography II	5
THEA 141	Play Direction Studio I	5
THEA 142	Play Direction Studio II	5
THEA 152	Advanced Stagecraft	5
THEA 155	Shakespeare to Go	5
THEA 157	Playwriting	5
THEA 159	Advanced Playwriting	5

Optional: If a theater arts major takes more than the one required faculty-directed production course (listed in

the separate section below), the second may be used toward one of the two upper-division studio course requirements.

Plus two history/theory/critical studies courses, chosen from:

THEA 100A	Asian Theater/Dance and Global Impacts	5
THEA 100B	Black Theater USA	5
THEA 100C	Courts, Courtesans, Shamans, and Clowns: Asian Drama	5
THEA 100W	Black/African Diasporic World Theater	5
THEA 104	Multimedia Authoring	5
THEA 108	Theater and Interaction Design	5
THEA 113	The History of Design for Theater	5
THEA 116A	History of Clothing and Costume	5
THEA 122	Indian Performance: Rama, Siva, Krishna	5
THEA 161C	Theater and Drama of the Renaissance	5
THEA 161D	Asian Theater: An Anthropological Approach	5
THEA 161H	Shakespeare In Asia	5
THEA 161M	Sexuality, Gender, Drama, and Performance	5
THEA 161P	Theater in the Chicano Power Movement	5
THEA 161Q	Queer Theatrics: Representations and Sensibilities	5
THEA 161R	Theater of American Cultures	5
THEA 161S	American Drama: Politics and Theater	5
THEA 161T	Women in Theater	5
THEA 161U	Performance of Story in Theater and Film	5
THEA 161Y	Modern Ancient Drama	5
THEA 163A	Shakespeare	5
THEA 163E	Chekhov and His Impact	5
THEA 163G	Special Studies in Playwrights: Artaud	5
THEA 163H	Henrik Ibsen and His Impact: Ghosts of the Future	5
THEA 163K	Special Studies in Playwrights: Euripides	5
THEA 164	Issues in Dance History and Theory	5
THEA 165	Dance Modernism	5
THEA 166	Ballet: A History	5
THEA 167	Africanist Aesthetics: Live Dialogues in the Americas and Africa	5

Plus one upper-division elective:

This may be any course listed in the upper-division studio section or the history/theory/critical studies sections above that is not being used to fulfill another requirement.

Plus one faculty-directed theater arts production

course:

THEA 137	Studies in Performance (Dance)	5
THEA 137A	Studies in Performance (Dance): Asian	5
THEA 151	Studies in Performance (Drama)	5
THEA 151A	Studies in Performance: African American Theater Arts Troupe	5
THEA 151I	Studies in Performance: Indonesian Dance and Drama	5
THEA 155	Shakespeare to Go	5

Plus this comprehensive requirement course:

THEA 185	Senior Seminar	5
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The following courses DO NOT satisfy theater arts major requirements:

THEA 55A	Workshop in Performance: Barnstorm	5
THEA 55B	Workshop in Performance: Barnstorm Lab	2
THEA 139	Random: With a Purpose	5
THEA 158	Chautauqua Workshop	5
THEA 190	Group Projects	5
THEA 198	Independent Field Study	5
THEA 199	Tutorial	5

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) Requirement. The DC Requirement in Theater Arts B.A. is met by completion of the required courses:

THEA 160	Dramatic Theories	5
THEA 185	Senior Seminar	5

Comprehensive Requirement

THEA 185	Senior Seminar	5
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Planners

Below are planners for frosh and junior transfer students.

Please note that **LD = lower division** (courses numbered 1–99), and **UD = upper division** (courses numbered 100–199).

Current course offerings can be found on the department website.

Four-Year Frosh Planner

	Fall	Winter	Spring
Year 1 (Frosh)	THEA 20 or THEA 21	THEA 61B (offered winter qtr only)	THEA 61C (offered spring qtr only)
			THEA 10

Year 2 (Soph)	THEA 61A (offered fall qtr only) THEA 30	THEA LD Elective [Faculty-Directed Production – see info. below]	THEA UD Studio	fall qtr only) THEA 20 or THEA 21	THEA 30	THEA 160 (offered spring qtr only; this is the prerequisite for THEA 185)
	THEA 50 (2-credit)	THEA 50 (2-credit)	THEA 50 (2-credit)	THEA 10	[Faculty-Directed Production—see info. below]	THEA LD elective
Year 3 (Jr)	THEA UD Studio	THEA UD History/Theory /Crit Studies	THEA 160 (offered spring qtr only; this is the prerequisite for THEA 185)	Year 2 (Sr)	THEA 185 (offered fall qtr only; prerequisite is THEA 160)	THEA UD History/Theory/Crit Studies
	THEA UD History/Theory /Crit Studies	THEA UD Elective			THEA UD studio	THEA UD elective
Year 4 (Sr)	THEA 185 (offered fall qtr only; prerequisite is THEA 160)			THEA 50 (2-credit)		

The specific courses shown in this four-year planner satisfy the IM, PR-C, and TA general education (GE) requirements. Other courses taken to fulfill major requirements may fulfill additional GE requirements. Students must satisfy all GE requirements. Students should consult their college advising office with any questions about GEs.

Faculty-Directed Production: Participation in one Faculty-Directed Production is a requirement for the theater arts major [separate from THEA 50 production courses]. Enrollment is by audition or interview; therefore, it is important that students begin trying to fulfill the requirement as early as possible as it cannot be predicted when they will be cast or chosen to participate. Contact the department advisor for information: theater-ugradadv@ucsc.edu. Details can also be found in the Theater Arts Undergraduate Handbook.

Two-Year Transfer Planner

	Fall	Winter	Spring
Year 1 (Jr)	THEA 61A (offered	THEA 61B (offered winter qtr only)	THEA 61C (offered spring qtr only)

In addition to the specific courses shown in this transfer planner, students must complete (or must have completed at another institution) courses satisfying all general education (GE) requirements. Students should consult their college advising office with any questions about GEs.

Faculty-Directed Production: Participation in one 5-credit Faculty-Directed Production class is a requirement for the theater arts major (separate from THEA 50 production classes). Enrollment is by audition or interview; therefore, it is important that students begin trying to fulfill the requirement as early as possible as it cannot be predicted when they will be cast or chosen to participate. Contact the department advisor for information: theater-ugradadv@ucsc.edu. Details can also be found in the Theater Arts Undergraduate Handbook.

THEATER ARTS MINOR

Students earn a minor in theater arts by completing eight courses (seven 5-credit courses and one 2-credit course) comprising a background in the theory and practice of the theater arts as well as a focus on drama, theater design/technology, or dance. The course requirements are listed below. There is no comprehensive requirement for the minor.

Declaration of the minor

There are no course requirements for declaring the minor, though individual courses may have enrollment prerequisites,

and a major must be officially declared before a minor may be declared.

To declare the minor, first have an Academic Planning Form and Petition for Minor Declaration form completed and signed by your major department advisor. While that plan is current, make an appointment to meet with the Theater Arts Department advisor to create a plan for and declare the minor—please use Slug Success to make an appointment. You may also contact the department advisor by emailing theater-ugradadv@ucsc.edu.

Students are strongly encouraged to consult early with the department advisor to create an academic plan for a minor in theater arts. This may be done prior to declaration.

Transfer students may petition to have equivalent lower-division courses taken at other schools count toward lower-division minor requirements and should consult with the Theater Arts Department academic advisor as early as possible regarding this possibility.

Course Requirements

Lower-Division Courses

Choose one from the following series:

THEA 61A	Ancient and Medieval Drama	5
THEA 61B	Drama from the Renaissance to the Modern Age	5
THEA 61C	The Birth of the Modern: Drama and Performance After the Renaissance	5

Plus one course in the student's area of focus chosen from:

THEA 10	Introduction to Theater Design and Technology	5
THEA 20	Introductory Studies in Acting	5
THEA 21	Acting Studio I: Psychological Realism	5
THEA 30	Introduction to Dance Theory and Technique	5
THEA 40	Introduction to Directing	5

Plus the following fundamentals course:

Students are highly encouraged to contact the department advisor early to learn about the unique enrollment process for THEA 50, as well as to complete this course as early as possible, before their last year on campus.

THEA 50	Fundamentals of Theater Production	2
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Upper-Division Courses

Three history/theory/critical studies courses chosen from the following:

THEA 100A	Asian Theater/Dance and Global Impacts	5
THEA 100B	Black Theater USA	5
THEA 100C	Courts, Courtesans, Shamans, and Clowns: Asian Drama	5

THEA 100W	Black/African Diasporic World Theater	5
THEA 104	Multimedia Authoring	5
THEA 108	Theater and Interaction Design	5
THEA 113	The History of Design for Theater	5
THEA 116A	History of Clothing and Costume	5
THEA 122	Indian Performance: Rama, Siva, Krishna	5
THEA 161C	Theater and Drama of the Renaissance	5
THEA 161D	Asian Theater: An Anthropological Approach	5
THEA 161H	Shakespeare In Asia	5
THEA 161M	Sexuality, Gender, Drama, and Performance	5
THEA 161P	Theater in the Chicano Power Movement	5
THEA 161Q	Queer Theatrics: Representations and Sensibilities	5
THEA 161R	Theater of American Cultures	5
THEA 161S	American Drama: Politics and Theater	5
THEA 161T	Women in Theater	5
THEA 161U	Performance of Story in Theater and Film	5
THEA 161Y	Modern Ancient Drama	5
THEA 163E	Chekhov and His Impact	5
THEA 163A	Shakespeare	5
THEA 163G	Special Studies in Playwrights: Artaud	5
THEA 163H	Henrik Ibsen and His Impact: Ghosts of the Future	5
THEA 163K	Special Studies in Playwrights: Euripides	5
THEA 164	Issues in Dance History and Theory	5
THEA 165	Dance Modernism	5
THEA 166	Ballet: A History	5
THEA 167	Africanist Aesthetics: Live Dialogues in the Americas and Africa	5

Plus two studio courses (one of which may be a faculty-directed production; see separate section below):

THEA 103	Design Concept Development	5
THEA 106	Digital Illustration	5
THEA 114	Sound Design and Engineering for the Theater	5
THEA 115A	Design Studio: Scenic Design	5
THEA 115B	Design Studio: Scenic Design B	5
THEA 117	Design Studio: Costume	5
THEA 117A	Advanced Costume Construction	5
THEA 118	Design Studio: Scene Painting	5
THEA 119	Design Studio: Lighting Studio B	5

THEA 120	Voice and Movement for Performers	5
THEA 121	Acting Studio II: Shakespeare	5
THEA 123	Acting and Shakespeare	5
THEA 124	Movement for Performers	5
THEA 126	Acting Studio III	5
THEA 126M	The Meisner Technique: A Practical Exploration	5
THEA 131A	Dance Studio II: Asian or Asian Diasporic Practice	5
THEA 131C	Dance Studio II: Advanced Contemporary Forms and Practices	5
THEA 135	Choreography I	5
THEA 136	Choreography II	5
THEA 141	Play Direction Studio I	5
THEA 142	Play Direction Studio II	5
THEA 152	Advanced Stagecraft	5
THEA 155	Shakespeare to Go	5
THEA 157	Playwriting	5
THEA 159	Advanced Playwriting	5

Optional: one faculty-directed theater arts production course, which may be used toward an upper-division studio requirement:

THEA 137	Studies in Performance (Dance)	5
THEA 137A	Studies in Performance (Dance): Asian	5
THEA 151	Studies in Performance (Drama)	5
THEA 151A	Studies in Performance: African American Theater Arts Troupe	5
THEA 151I	Studies in Performance: Indonesian Dance and Drama	5
THEA 155	Shakespeare to Go	5

The following do NOT satisfy theater arts minor requirements:

THEA 55A	Workshop in Performance: Barnstorm	5
THEA 55B	Workshop in Performance: Barnstorm Lab	2
THEA 139	Random: With a Purpose	5
THEA 158	Chautauqua Workshop	5
THEA 190	Group Projects	5
THEA 198	Independent Field Study	5
THEA 199	Tutorial	5

DANCE MINOR

Students earn a minor in dance by completing eight courses (seven 5-credit courses and one 2-credit course) comprising a background in the theory and practice of dance. The course requirements are listed below. There is no comprehensive requirement for the minor.

DECLARATION OF THE MINOR

There are no course requirements for declaring the minor, though individual courses may have enrollment prerequisites, and a major must be officially declared before a minor may be declared.

To declare the minor, first have an Academic Planning Form and Petition for Minor Declaration form completed and signed by your major department advisor. While that plan is current, make an appointment to meet with the Theater Arts Department academic advisor to create a plan for and declare the minor. Please use Slug Success to make an appointment. You may also contact the department advisor by emailing theater-ugradadv@ucsc.edu.

Students are strongly encouraged to consult early with the department advisor to create an academic plan for a minor in dance. This may be done prior to declaration.

Transfer students may petition to have equivalent lower-division courses taken at other schools count toward lower-division minor requirements and should consult with the Theater Arts Department academic advisor as early as possible regarding this possibility.

Course Requirements

Lower-Division Courses

Lower-division courses may be used to fulfill requirements in both the theater arts major and dance minor, but separate upper-division courses must be taken to satisfy major and minor requirements. Consult with the department advisor if planning to pursue both the theater arts major and dance minor.

One course in creative practice, chosen from:

THEA 30	Introduction to Dance Theory and Technique	5
THEA 33C	Dance Studio I	5
THEA 36	Introduction to Dance Composition	5

Plus one course in cross-cultural techniques, chosen from:

THEA 22	Indonesian Dance and Drama	5
THEA 31A	Dance Studio I: Asian or Asian Diasporic Practice	5
THEA 31B	Dance Studio I: Ballet	5
THEA 31C	Dance Studio I: Contemporary Dance Theory and Technique	5
THEA 37	African Dance	5
THEA 80R	Bollywood Dance and Culture in India and Indian Diaspora	5
THEA 80U	Everybody Dance Now!	5
THEA 80Z	Indian Dance	5

The following fundamentals course:

Students are highly encouraged to contact the department advisor early to learn about the unique enrollment process for THEA 50, as well as to complete this course as early as possible, before their last year on campus.

THEA 50	Fundamentals of Theater Production	2
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Upper-Division Courses

One course in creative practice or cross-cultural techniques, chosen from:

THEA 131A	Dance Studio II: Asian or Asian Diasporic Practice	5
THEA 131B	Dance Studio II: Ballet	5
THEA 131C	Dance Studio II: Advanced Contemporary Forms and Practices	5
THEA 135	Choreography I	5
THEA 136	Choreography II	5

Plus one course in critical studies, chosen from:

THEA 164	Issues in Dance History and Theory	5
THEA 165	Dance Modernism	5
THEA 166	Ballet: A History	5
THEA 167	Africanist Aesthetics: Live Dialogues in the Americas and Africa	5

Plus three upper-division elective courses, which may be chosen from the following:

THEA 100A	Asian Theater/Dance and Global Impacts	5
THEA 100C	Courts, Courtesans, Shamans, and Clowns: Asian Drama	5
THEA 122	Indian Performance: Rama, Siva, Krishna	5
THEA 124	Movement for Performers	5
THEA 137	Studies in Performance (Dance)	5
THEA 137A	Studies in Performance (Dance): Asian	5
THEA 139	Random: With a Purpose	5
THEA 1511	Studies in Performance: Indonesian Dance and Drama	5
THEA 161D	Asian Theater: An Anthropological Approach	5

Any upper-division course listed in the Creative Practice/Cross-Cultural Techniques or Critical Studies sections may be used as an elective (but not double counted).

A select number of other courses may be used if approved by the department in advance (consult with the department advisor).

The following DO NOT satisfy the dance minor requirements:

THEA 55A	Workshop in Performance: Barnstorm	5
THEA 55B	Workshop in Performance: Barnstorm Lab	2
THEA 158	Chautauqua Workshop	5
THEA 190	Group Projects	5
THEA 198	Independent Field Study	5
THEA 199	Tutorial	5

THEATER ARTS M.A.

Introduction

The Theater Arts Department offers a 12-month Master of Arts (M.A.) in Theater Arts degree, which serves as a bridge from undergraduate work to professional work in a range of performance-related fields. It can also place students in an excellent position to pursue further graduate academic work, such as an M.F.A. or Ph.D.

Requirements

Course Requirements

Students are required to complete 40 credits for the M.A. in Theater Arts.

This includes three graduate seminars for a total of 15 credits:

THEA 290A	Text Analysis	5
THEA 290B	Performance Histories	5
THEA 290C	Performance Analysis	5

Students must also complete a 10-credit performance research project that includes a professional internship project:

THEA 293	Performance Research Project	10
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Students must also complete the following three 5-credit courses:

THEA 294	Future Stages	5
THEA 295	Group Critique	5
THEA 299	Capstone Thesis	5

Other Requirements

[Optional Catchall]

Applying for Graduation

HUMANITIES DIVISION

500 Humanities 1 Building
(831) 459-2696
<https://humanities.ucsc.edu/>

What does it mean to be human, to analyze and construct the human experience? These are the fundamental questions that guide and unite the learning, teaching and scholarship conducted in UC Santa Cruz's Humanities Division. The exploration and discussion of this query has culminated in some of humanity's most deeply and widely valued beliefs and teachings about ourselves and the world in which we live.

Departments and programs in the Humanities Division at UC Santa Cruz train students to research the human condition in all of its complexity and diversity to become aware and effective citizens of the world, and to become visionaries and leaders in their chosen careers. The humanities provide a critical framework for thinking about the future through the lens of the past and the present.

Programs in the Humanities at UC Santa Cruz are nationally recognized for their quality faculty in the Humanities are recognized for their dedication to research and teaching. Students in the Humanities have the opportunity to work closely with faculty mentors on research projects that achieve award-winning results.

The following undergraduate majors are offered: applied linguistics and multilingualism, classical studies, critical race and ethnic studies, feminist studies, history, Italian studies, Jewish studies, language studies, linguistics, literature, philosophy, and Spanish studies. In addition, there are minors in classical studies, East Asian studies, history of consciousness, history, Italian studies, Jewish studies, language studies, linguistics, literature, and philosophy.

At the graduate level, the Ph.D. is offered by programs in feminist studies, history, history of consciousness, linguistics, literature, and philosophy. Master's (M.A.) programs are offered in history, linguistics, literature, and philosophy.

The Writing Program offers courses and assessments related to university and campus writing requirements and coordinates with the undergraduate colleges in delivering the college core curriculum.

The Humanities Institute at UC Santa Cruz is a hub for academic research, cross-discipline collaboration, and public engagement. They incubate ideas and foster innovation by funding projects, centers, and research clusters that enable faculty and students to work on some of the biggest problems of our day.

Critical Race and Ethnic Studies

416 Humanities I
(831) 459-2757
<https://cres.ucsc.edu/>

PROGRAMS OFFERED

Critical Race and Ethnic Studies B.A. (p. 103)

Black Studies Minor (p. 109)

Critical Race and Ethnic Studies Designated Emphasis (p. 111)

UNDERGRADUATE PROGRAM

Launched in 2014-15, the Critical Race and Ethnic Studies (CRES) curriculum has been formally organized so that undergraduate students may pursue organized study leading toward a bachelor of arts degree. CRES majors develop a deep understanding of how race and other modalities of power have structured human life and have informed the imagination of social transformation and justice in the past and the present. CRES accordingly offers a study of the dynamic power relations resulting from the cultural and institutional productions of the idea of "race" on a local, national, and global scale. Here, "race" is understood as a major ideological framework through which both practices of power and domination and struggles for liberation and self-determination have been articulated and enacted throughout modern history and in the contemporary moment. The study of "race," as such, is a rigorous project, one which yields critical insights into the social, political, cultural, and economic processes that have defined and shaped the modern era—colonialism and slavery, conquest and displacement, genocide and warfare, migration and creolization, criminalization, imprisonment and disenfranchisement, globalization, and post-9/11 security state policies such as racial profiling. These phenomena orient our attention to particular academic fields with which CRES is necessarily in dialogue. These fields include postcolonial studies, settler colonialism studies, human rights studies, indigenous studies, migration, diaspora and border studies, mixed race studies, legal studies, environmental studies, and science studies.

Faculty from across the UC Santa Cruz campus have contributed significantly to conversations in critical race and ethnic studies for decades, with nationally renowned faculty in anthropology, community studies, feminist studies, film and digital media, history, history of art and visual culture, history of consciousness, Latin American and Latino studies, literature, politics, psychology, social documentation, sociology, and the sciences. In addition to courses specifically offered under the subject of CRES, many courses engaging critical race and ethnic studies are sponsored by these departments across campus.

Black Studies Minor

Launched fall 2020, the Black studies minor offers students grounding in the intellectual histories, political movements, cultural expressions, and critical theories of the Black diaspora, all while engaging a range of methodologies from across disciplines. Attention to the significance of social justice is a hallmark of the minor. Supported by faculty expertise in Africa, the Caribbean, the Americas, Europe, and the Pacific, students can explore the globally multi-sited nature of Black freedom

struggles, both past and present, and examine blackness through a comparative lens.

GRADUATE PROGRAM

Also launched in 2014-2015, the Designated Emphasis (DE) in Critical Race and Ethnic Studies (CRES) is available for doctoral students to pursue alongside their doctoral degree program. To complete the DE, students must have a faculty adviser from the CRES faculty, complete four relevant courses, and complete a significant piece of scholarly writing in the area of CRES. Students pursuing the designated emphasis are encouraged to serve as a teaching assistant for at least one CRES course, and may be eligible to teach a CRES course of their own design as a graduate student instructor.

CRITICAL RACE AND ETHNIC STUDIES B.A.

Information and Policies

Introduction

The B.A. program in critical race and ethnic studies (CRES) offers an interdisciplinary curriculum that enables majors to examine the dynamic power relations resulting from the cultural and institutional productions of the idea of "race" on a local, national, and global scale. Our majors study the history of race and ethnicity both in the United States and across the globe, and they learn how the constructs of race and racism have changed over time. By approaching race as a major ideological framework through which practices of power and domination as well as struggles for liberation and self-determination have been articulated and enacted throughout modern history and in the contemporary moment, our majors develop a deep understanding of how race and other modalities of power have informed the imagination and trajectory of social transformation and justice in the past and the present. The study of race in CRES yields critical insights into the social, political, cultural, and economic processes that have defined and shaped the modern era—colonialism, slavery, conquest, displacement, genocide, warfare, migration, creolization, criminalization, imprisonment, disenfranchisement, globalization, racial profiling, and post-9/11 security state policies. Our majors also examine historical racial/ethnic ideologies such as multiculturalism, colorblindness, and postracialism as well as contemporary social phenomena such as changing working conditions, new migration patterns, and emergent cultural expressions. Students further explore the ways that race and ethnicity have developed in concert with gender, sexuality, class, indigeneity, citizenship, and other areas of power, privilege, and lived identity, as well as the role they play in access to education, employment, welfare services, and participation in politics, the economy, and the arts.

The academic fields with which CRES is necessarily in dialogue include postcolonial studies, settler colonialism studies, human rights studies, indigenous studies, migration, diaspora and border studies, mixed race studies, legal studies, environmental studies, and science studies. CRES majors draw on methods and concepts from different academic disciplines in

order to better understand historical and contemporary social phenomena and problems. The major allows students flexibility at the upper-division level to design an interdisciplinary course of study that enables a general overview of areas of interest, while selecting electives from multiple areas of specific research and career interests. Alternatively, they can engage deeply with a key area of focus, taking a number of courses in a particular area in order to develop expertise in it. For example, they may wish to focus on a social group (e.g., members of the African diaspora), on a discipline (e.g., history), on a social phenomenon (e.g., social movements), or on a methodological or theoretical orientation (e.g., theories of race, gender and sexuality).

Through immersion in a program of study that is multidisciplinary, comparative, and transnational in scope, CRES majors develop a critical perspective on race, racial relations, and racial justice in the United States and beyond. CRES also helps students develop skills in critical thinking, comparative analysis, the application of social theory, research, communication, and writing so that they can act effectively in an ever-changing, complex, and culturally diverse world. A student with a bachelor's degree in CRES will be well prepared for graduate-level study in the humanities, social sciences, law, medicine/public health, education and international affairs and strongly positioned to pursue careers in the private, public and non-profit sectors.

Academic Advising for the Program

Email: cres@ucsc.edu
Phone: (831) 459-2757

CRES advising is held in Humanities 1, room 416. Drop in hours are posted on the CRES website. Students can make an appointment by using the Slug Success application found under Resources in their student portal (MyUCSC).

Transfer students should consult the Transfer Student Information and Policy section for specific requirements.

Getting Started in the Major

Students interested in CRES may declare at any time. While specific courses are not required in order to declare, ideally, students will be enrolled in or have completed CRES 10 with a C or better. (Please see the section "How to Declare a Major" for details.) All requirements of the major can be completed within two years.

Program Learning Outcomes

Students who complete the CRES major should emerge with the following skills, competencies, and knowledge:

Critical Frameworks

- Demonstrate deep knowledge of historical, contemporary, and intersectional perspectives on race and ethnicity.
- Demonstrate familiarity with different disciplinary methods applied to race and ethnicity.

- Demonstrate a critical perspective on institutional power and knowledge.

Communication

- Demonstrate ability to account for other people's arguments, to formulate one's own arguments, and to locate both arguments in the larger context of the field.
- Demonstrate ability to formulate an argument in alternative media, such as speech, audiovisual, digital, and other forms of non-written communication.
- Demonstrate writing effectively in the interdisciplinary field.

Research

- Demonstrate ability to design and implement a collaborative research project.
- Demonstrate ability to design and implement an independent research project.

Community Collaboration, Engagement, and Activism

- Demonstrate an understanding of the issues, ethics, and methods surrounding activist, collaborative, and community-based research projects.
- Demonstrate an understanding of collaborative knowledge that effectively integrates theoretical and experiential thinking about social justice.

Major Qualification Policy and Declaration Process

Major Qualification

Students may declare the CRES major at any time. Transfer students should consult the Transfer and Information Policy section below.

Appeal Process

A student may file an appeal with the CRES advisor within 15 days of the denial of major declaration. The CRES Department will notify the student and the college of the decision within 15 days of the receipt of the appeal.

How to Declare a Major

Students may declare the major by submitting a proposed Petition for Major/Minor Declaration to the department advisor. The major declaration should include a plan to complete CRES 10, CRES 100, and CRES 101 at the next possible opportunity.

Per campus policy, students must submit their major declaration no later than the third quarter of their sophomore year or, in the case of transfer students, no later than the second quarter of their junior year. CRES welcomes students who are pursuing more than one major or who are transferring from another major to declare after this time frame.

Transfer Information and Policy

Transfer Admission Screening Policy

No major preparation courses are required prior to transfer; however, prospective students are strongly encouraged to complete the Intersegmental General Education Transfer Curriculum (IGETC) or to complete all UC Santa Cruz general education requirements before matriculation.

Getting Started at UCSC as a Transfer Student

Transfer students are encouraged to declare the major and enroll in CRES 10 as soon as possible to be assured entrance into the required core courses. Transfer students and students in exceptional circumstances may substitute an equivalent course with the department chair or undergraduate director's approval.

Letter Grade Policy

This program does not have a letter grade policy.

[Optional Catchall]

Course Substitution Policy

CRES is an interdisciplinary major that includes courses taught by faculty in other departments (see the Electives section below for a list of approved courses). Students who wish to substitute a course not on the electives list should complete the Petition for Course Credit form available on the CRES website and submit the completed form to CRES advising.

Double Majors and Major/Minor Combinations Policy

The CRES major works very well as a double major with numerous fields of study such as anthropology, community studies, creative writing, feminist studies, film and digital media, education, environmental studies, history, history of art and visual culture, legal studies, linguistics, languages, literature, politics, sociology, theater arts, and more.

Study Abroad

Honors

CRES awards honors and highest honors in the major. Students are considered for honors and highest honors based on their cumulative GPA, calculated from grades earned in coursework and the senior exit requirement undertaken for completion of the major. For honors, students must earn a minimum GPA of 3.70 in the relevant courses, while for highest honors, the GPA must be 3.90 or higher. Writing a thesis is not a requirement for receiving honors or highest honors.

[Optional Catchall]

Requirements and Planners

Course Requirements

To graduate with a major in CRES, a student is required to complete 10 courses with the approval of the department.

Lower-Division Courses

One lower-division foundation course:

CRES 10	Critical Race and Ethnic Studies: An Introduction	5
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Upper-Division Courses

Two upper-division core courses are required for the major:

CRES 100	Comparative Theories of Race and Ethnicity	5
CRES 101	Research Methods and Writing in Critical Race and Ethnic Studies	5

Electives

Students must complete at least six electives offered in critical race and ethnic studies (with the CRES designation) or from the lists below. At least five must be upper-division, and up to one lower-division course is allowed. For current offerings, please visit the CRES course page.

- At least two electives must be from the list of designated courses focusing on phenomena outside of the U.S. or on transnational or hemispheric subjects.
- At least two academic divisions must be represented in the elective coursework.

Students are encouraged to supplement their upper-division coursework with language study, internships, and individual or group independent studies. Students may petition to have up to 10 credits of such activities substituted for upper-division elective requirements, so long as these activities serve, or do not interfere with, the breadth requirements.

Arts

FILM 165B	Race on Screen	5
FILM 165D	Asian Americans and Media	5
FILM 165E	Chicana/o Cinema, Video	5
HAVC 140A	America in Art	5
HAVC 140B	Victorian America	5
HAVC 140C	Race and American Visual Arts	5
HAVC 140D	Chicano/Chicana Art: 1970-Present	5
HAVC 141B	Death, Desire, and Modernity	5
HAVC 141F	The Camera and the Body	5
HAVC 141K	Activist Art Since 1960: Art, Technology, Activism	5
HAVC 142	Contemporary Art and Ecology	5
HAVC 190J	Visual Cultures of the Vietnam-American War	5
HAVC 191B	The Virgin of Guadalupe: Images and Symbolism in Spain, Mexico, and the U.S.	5
HAVC 191C	Subalternatives: Representing Others	5
HAVC 191E	Feminist Theory and Art Production	5
HAVC 191K	Decolonial Visual Culture	5
MUSC 800	Music, Politics, and Protest	5

MUSC 81A	Survey of Rap and Hip Hop Music	5
MUSC 81M	Chicano/Latino Music in the United States	5
THEA 151A	Studies in Performance: African American Theater Arts Troupe	5

Humanities

CRES 45	Pilipinx Historical Dialogue	5
CRES 68	Approaches to Black Studies	5
CRES 111	The Sounds of Struggle	5
CRES 114	Race and Disability in American Drama	5
CRES 118	Abolitionist Futures	5
CRES 150	Race, Gender and Algorithms	5
CRES 181	The Lynch Doctrine: From Rough Justice to Stand Your Ground	5
CRES 185A	Race, Gender, and Science	5
CRES 188B	Topics in Black Studies	5
FMST 123	Feminism and Cultural Production	5
FMST 124	Technology, Science, and Race Across the Americas	5
FMST 125	Race, Sex, and Technology	5
FMST 126	Images, Power, and Politics: Methods in Visual and Textual Analysis	5
FMST 131	The Politics of Matter and the Matter of Politics	5
FMST 139	African American Women's History	5
FMST 145	Racial and Gender Formations in the U.S.	5
HIS 104C	Celluloid Natives: American Indian History on Film	5
HIS 104D	Museums and the Representation of Native American History, Memory, and Culture	5
HIS 106B	Asian and Asian American History, 1941-Present	5
HIS 109A	Race, Gender, and Power in the Antebellum South	5
HIS 110D	The Civil War Era	5
HIS 110H	Greater Reconstruction: Race, Empire, and Citizenship in the Post-Civil War United States	5
HIS 111	Popular Conceptions of Race in U.S. History, 1600-Present	5
HIS 116A	Unchained Memory: Slavery and the Politics of the Past	5
HIS 120	W.E.B. Du Bois	5
HIS 121A	African American History to 1877	5
HIS 121B	African American History: 1877 to the Present	5
HIS 122A	Jazz and United States Cultural History, 1900-1945	5
HIS 122B	Jazz and United States Cultural History, 1945 to the Present	5

HIS 123	Immigrants and Immigration in U.S. History	5	LIT 189U	Modernidad y literatura: El Boom de la novela latinoamericana	5
HIS 128	Chicana/Chicano History	5	LIT 189V	Andean Indigenismo	5
HIS 145	Gender, Colonialism, and Third-World Feminisms	5	LIT 190Y	Topics in Jewish Literature and Culture	5
HIS 151A	Medicine and the Body in the Colonial World	5			
HIS 158A	The Escapes of David George: Biographical Research on Slavery and Early America	5	Social Sciences		
HIS 190D	Asian and Latino Immigration Since 1875	5	ANTH 110Q	Queer Sexuality in Black Popular Culture	5
HIS 190Y	The Atlantic Slave Trade	5	ANTH 130O	Native Feminisms, Gender, and Settler Colonialism	5
HIS 194I	U.S. Bases and Social Movements in Asia	5	ANTH 131	Gender in Cross-Cultural Context	5
LIT 102	Translation Theory	5	ANTH 140	The Body in Rain: Environmental and Medical Intersections	5
LIT 121L	Green Ache: Ecopoetics, Race, and Material	5	ANTH 149	Anthropology of Activism	5
LIT 121N	RAGE: Race and Performance	5	ANTH 158	Feminist Ethnographies	5
LIT 125H	Modern Arabic Novel	5	ANTH 187	Cultural Heritage in Colonial Contexts	5
LIT 133H	Haunted by the Forgotten War: Literature and Film of the Korean War	5	ANTH 196J	Imagining America	5
LIT 134A	Caribbean Literature	5	CMMU 101	Communities, Social Movements, and the Third Sector	5
LIT 135F	Empire and After in the Anglophone Novel	5	CMMU 163	Health Care Inequalities	5
LIT 135G	Postcolonial Writing	5	ECON 128	Poverty and Public Policy	5
LIT 138B	Regions in American Literature	5	EDUC 102	Education, Media, and Society	5
LIT 145A	Colonial American Literatures	5	EDUC 104	Ethical Issues and Teaching	5
LIT 146D	Nineteenth-Century American Fiction	5	EDUC 125	Multicultural Children's Literature for Elementary Classrooms	5
LIT 147A	Twain, Slavery, and the Literary Imagination	5	EDUC 128	Immigrants and Education	5
LIT 149E	Modern Fiction and Poetry	5	EDUC 135	Gender and Education	5
LIT 149B	Contemporary American Literature	5	EDUC 140	Language, Diversity, and Learning	5
LIT 160E	Theorizing Race and Comics	5	EDUC 141	Bilingualism and Schooling	5
LIT 160K	Race, Labor, and Migration	5	EDUC 160	Issues in Educational Reform	5
LIT 161A	African American Literature	5	EDUC 164	Urban Education	5
LIT 161B	African American Women Writers	5	EDUC 173	Seminar in Critical Pedagogy	5
LIT 162A	Asian American Literature	5	EDUC 174	Ethnographic Research in Schools and Communities	5
LIT 163A	American Indian Literature	5	EDUC 177	Teaching Linguistically Diverse Students	5
LIT 164A	Jewish Travel Narratives	5	EDUC 181	Race, Class, and Culture in Education	5
LIT 164D	Jewish Diaspora, Ethnicity, and Urban Life	5	LALS 112	Immigration and Assimilation	5
LIT 164J	Jewish Writers and the American City	5	LALS 128	Latino Media in the U.S	5
LIT 165B	Latino Fictions of the Americas	5	LALS 131	Latino Literatures: Assimilation and Assimilability	5
LIT 169A	White Flow(n): Race, Gender, and Material	5	LALS 143	Race and Ethnicity	5
LIT 182I	Littérature d'expression française hors de France	5	LALS 144	Mexicana/Chicana Histories	5
LIT 183P	Fremdenangst: Ausländerfeindlichkeit in der deutschen Literatur und Kultur	5	LGST 111B	Civil Liberties	5
LIT 189F	Literaturas Latinas en los Estados Unidos: en inglés, español y Spanglish	5	LGST 135	Native Peoples Law	5
			POLI 110	Law and Social Issues	5
			PSYC 153	The Psychology of Poverty and Social Class	5
			PSYC 155	Social-Community Psychology in Practice	5
			PSYC 159H	Community-Based Interventions	5

HIS 184B	Racism and Antiracism in Europe: From 1870 to the Present	5		cultural en el mundo Latino Americano	
HIS 185I	Latin American Jewish History in the Modern Period	5	LIT 1900	Studies in Slavery, Race, and Nation in the Americas	5
HIS 185J	The Modern Jewish Experience	5			
HIS 190A	Slavery and Race in Latin America	5	ANTH 110O	Postcolonial Britain and France	5
HIS 190B	Race and the Nation in Latin America	5	ANTH 110P	India and Indian Diaspora through Film	5
HIS 190N	Topics in African History	5	ANTH 129	Beyond Borders: Other Globalizations and Histories of Interconnection	5
HIS 190X	History of the Atlantic World, 1492-1824	5	ANTH 130A	Anthropology of Africa.	5
HIS 194T	Worlds of Labor in Asia	5	ANTH 130C	Politics and Culture in China	5
HIS 194U	The Cold War and East Asia	5	ANTH 130F	Blackness In Motion: Anthology of the African Diasporas	5
HIS 196N	Eastern European Jewish Social History	5	ANTH 130I	Cultures of India	5
LIT 131C	Worldings	5	ANTH 130L	Ethnographies of Latin America	5
LIT 133F	Pacific Rim Discourse	5	ANTH 130T	Religion and Politics in the Muslim World	5
LIT 133G	The Nuclear Pacific	5	ANTH 159	Race and Anthropology	5
LIT 133I	Global Japan: Literatures of the Japanese Diaspora	5	ANTH 194X	Women in Politics: A Third World Perspective	5
LIT 135A	Topics in African Literature	5	CMMU 145	Global Capitalism: a History of the Present	5
LIT 137A	Global Cities	5	EDUC 170	East Asian Schooling and Immigration	5
LIT 138A	Culture and Nation	5	EDUC 171	South and Southeast Asian Schooling and Immigration	5
LIT 149F	Contemporary Mexican Narrative	5	LALS 100	Concepts and Theories in Latin American and Latina/o Studies	5
LIT 155A	Cinema and Subjectivity	5	LALS 115	Mexico-United States Migration	5
LIT 155E	Cinema and Social Change in Latin America	5	LALS 127	Genero, Nacion Y Modernidad En El Cine	5
LIT 160I	Race, Militarism, and Empire in Asia and the Pacific	5	LALS 145	Grassroots Social Change in Latin America	5
LIT 160J	Exile, Diaspora, Migration	5	LALS 150	Afro-Latinos/as: Social, Cultural, and Political Dimensions	5
LIT 162B	Literature of the Asian Diaspora	5	LALS 152	Consumer Cultures Between the Americas	5
LIT 164C	Global Jewish Writing	5	LALS 165	Contemporary Peru	5
LIT 164G	Literature and the Holocaust	5	LALS 170	Indigenous Struggles in the Americas	5
LIT 164H	Jewish Writers and the European City	5	LALS 171	Brazil in Black and White	5
LIT 165A	Chicano/Mexicano Geographies	5	LALS 172	Visualizing Human Rights	5
LIT 165C	Mesoamerican Indigenous/Indigenista Literature	5	LALS 175	Migration, Gender, and Health	5
LIT 168A	The Culture of Islamic Law	5	LALS 178	Gender, Transnationalism, and Globalization	5
LIT 189A	De la conquista a Sor Juana	5	LALS 180	Borders: Real and Imagined	5
LIT 189E	Cuba	5	LALS 194H	Central America and the United States	5
LIT 189H	La Globalizacion en/del Cine Latin/o Americano	5	POLI 140C	Latin American Politics	5
LIT 189L	Poesía latinoamericana	5	SOCY 128	Law and Politics in Contemporary Japan and East Asian Societies	5
LIT 189M	Prosa contemporánea hispanoamericana	5	SOCY 128M	International Law and Global Justice	5
LIT 189N	Latinoamericano testimonio	5			
LIT 189O	El Cuento Hispanoamericano: Variedades estéticas de la literatura breve en America Latina	5			
LIT 189P	Las mujeres en la literatura latinoamericana	5			
LIT 189Q	Ficción y marginalidad	5			
LIT 189S	La cultura popular en la narrativa latinoamericana	5			
LIT 189T	Historia de la lectura y los lectores: Recepcion y consumo	5			

The Colleges

CLTE 135	Apprenticeship in Community Engaged Research	5
CLTE 136	Methodologies of Critical Praxis	5

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division disciplinary communication (DC) requirement. The DC requirement in CRES is satisfied by completing the Comprehensive Requirement (see below).

Comprehensive Requirement

The comprehensive requirement is fulfilled by completing a senior seminar from the CRES 190 series, or one of the other senior seminars listed below. CRES 190 series courses in the current General Catalog are also listed below; any CRES 190 series course that is listed in a subsequent General Catalog will also satisfy the comprehensive requirement.

Prerequisites for the CRES 190 series include CRES 10 and CRES 100 and satisfaction of the Entry Level Writing and Composition requirements. Senior seminars outside of CRES may have additional enrollment restrictions or prerequisites.

CRES 190A	Critical Race Feminisms	5
CRES 190B	Critical Migration Studies	5
CRES 190P	Trans of Color Movements in Media, Art and Performance	5
CRES 190S	From Slavery to Precarity: Race, Logistics and Globalization	5
CRES 190T	The War on Terror: Imperialism Past and Present	5
FMST 194K	Black Diaspora	5
FMST 194L/CRES 10/CRES 100	Comparative Settler Colonial Studies	5
FMST 194M/CRES 10/CRES 100	Empire and Sexuality	5
FMST 194O	The Politics of Gender and Human Rights	5
FMST 194Q/CRES 10/CRES 100	Queer Diasporas	5
FMST 194U	Touring War and Empire	5
FMST 194V	Marxism and Feminism	5
ANTH 196G	Queer Worlds: Sexuality, Intimacy and Power in Contemporary Ethnography	5

Planners**Four-Year Sample Academic Plan For CRES Major (Frosh)**

Students must have satisfied the English language and writing requirement (ELWR) and have completed the C1 requirement in order to enroll in CRES 10. Students who place into C2 in their first fall quarter may enroll in CRES 10 in their first fall quarter.

1st (frosh)**Fall****Winter****Spring****2nd (soph)**

CRES 10

CRES 100

CRES 101

CRES
elective**3rd (junior)**CRES
electiveCRES
electiveCRES
electiveCRES
elective**4th (senior)**CRES
elective

CRES 190

Students must also complete all general education requirements except for ER, which is satisfied by CRES 10.

Two-Year Sample Academic Plan for CRES Major (Transfer Students)

Transfer students should complete their general education (GE) requirements or IGETC before enrolling at UCSC, but this is not a requirement to complete the major within two years of transferring. The CRES major consists of 10 courses, allowing transfer students to complete about two CRES courses per quarter along with additional units to complete the required 180 units for graduation.

Sample Transfer-Students Academic Planner for CRES Major – Fall Admission

	Fall	Winter	Spring
1st (junior)	CRES 10	CRES 100	CRES 101
		CRES elective	CRES elective
2nd (senior)	CRES elective	CRES elective	CRES 190
	CRES elective	CRES elective	

BLACK STUDIES MINOR

Housed in the Critical Race and Ethnic Studies (CRES) Department, the Black Studies minor offers students grounding in the intellectual histories, political movements, cultural

expressions, and critical theories of the black diaspora, all while engaging a range of methodologies from across disciplines. Attention to the significance of social justice is a hallmark of the minor. Supported by faculty expertise in Africa, the Caribbean, the Americas, Europe, and the Pacific, students can explore the globally multi-sited nature of black freedom struggles, both past and present, and examine blackness through a comparative lens.

Through careful advising, students can pursue a set of electives, tailored to their interests, enabling broad or deep exploration of specific histories, geographic regions, and thematic concerns. With a foundation in CRES 68, Approaches to Black Studies (substitutable with CRES 10, Critical Race and Ethnic Studies: An Introduction), students will undertake an additional 25 credits—or five upper-division elective courses—drawn from the Arts, Humanities, and Social Sciences divisions. Students can select these five electives from a list of pre-approved courses, with no more than three from any one program or department. Courses not appearing on the approved list can be petitioned for credit.

Course Requirements

Lower-Division Courses

One lower-division core course:

CRES 68	Approaches to Black Studies	5
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Students may substitute CRES 10, Critical Race and Ethnic Studies: An Introduction, for the lower-division core course requirement.

Upper-Division Courses

Five upper-division courses, with no more than three from any one program or department:

Division of Humanities

CRES 188B	Topics in Black Studies	5
FMST 102	Feminist Critical Race Studies	5
FMST 115	Gender, Sexuality, and Transnational Migration Across the Americas	5
FMST 124	Technology, Science, and Race Across the Americas	5
FMST 125	Race, Sex, and Technology	5
FMST 139	African American Women's History	5
FMST 145	Racial and Gender Formations in the U.S	5
HIS 109A	Race, Gender, and Power in the Antebellum South	5
HIS 110A	Colonial America, 1500-1750	5
HIS 110D	The Civil War Era	5
HIS 110H	Greater Reconstruction: Race, Empire, and Citizenship in the Post-Civil War United States	5
HIS 111	Popular Conceptions of Race in U.S. History, 1600-Present	5
HIS 116	Slavery Across the Americas	5
HIS 116A	Unchained Memory: Slavery and the Politics of the Past	5

HIS 120	W.E.B. Du Bois	5
HIS 121A	African American History to 1877	5
HIS 121B	African American History: 1877 to the Present	5
HIS 122A	Jazz and United States Cultural History, 1900-1945	5
HIS 122B	Jazz and United States Cultural History, 1945 to the Present	5
HIS 137A	Africa to 1800	5
HIS 137B	Africa from 1800 to the Present	5
HIS 158C	Slavery in the Atlantic World: Historical and Archaeological Perspectives	5
HIS 177A	Slaves, Soldiers, and Scientists: History of the Tropics	5
LIT 121N	RAGE: Race and Performance	5
LIT 135A	Topics in African Literature	5
LIT 146D	Nineteenth-Century American Fiction	5
LIT 147A	Twain, Slavery, and the Literary Imagination	5
LIT 161A	African American Literature	5
LIT 161B	African American Women Writers	5
LIT 190O	Studies in Slavery, Race, and Nation in the Americas	5

Division of Social Sciences

ANTH 110Q	Queer Sexuality in Black Popular Culture	5
ANTH 130A	Anthropology of Africa.	5
ANTH 130F	Blackness In Motion: Anthology of the African Diasporas	5
ANTH 130L	Ethnographies of Latin America	5
ANTH 159	Race and Anthropology	5
ANTH 194L	Archaeology of the African Diaspora	5
ANTH 196J	Imagining America	5
EDUC 160	Issues in Educational Reform	5
EDUC 164	Urban Education	5
EDUC 181	Race, Class, and Culture in Education	5
LALS 150	Afro-Latinos/as: Social, Cultural, and Political Dimensions	5
LALS 171	Brazil in Black and White	5
SOCY 128I	Race and Law	5
SOCY 133	Currents in African American Cultural Politics	5
SOCY 180	Social Movements of the 1960s	5

Division of Arts

FILM 165B	Race on Screen	5
HAVC 110	Visual Cultures of West Africa	5

HAVC 111	Visual Cultures of Central Africa	5
HAVC 115	Gender in African Visual Culture	5
HAVC 116	African Architecture	5
HAVC 117	Contemporary Art of Africa	5
HAVC 118	Art of the Contemporary African Diaspora	5
HAVC 140C	Race and American Visual Arts	5
MUSC 180B	Studies in World Musics: Africa and the Americas	5
THEA 100B	Black Theater USA	5
THEA 100W	Black/African Diasporic World Theater	5
THEA 151A	Studies in Performance: African American Theater Arts Troupe	5
THEA 167	Africanist Aesthetics: Live Dialogues in the Americas and Africa	5

CRITICAL RACE AND ETHNIC STUDIES DESIGNATED EMPHASIS

Introduction

Requirements

Graduate students from other departments may obtain a designated emphasis in Critical Race and Ethnic Studies (CRES) by completing the following requirements in addition to the requirements for the doctorate in their home department:

Committee Composition and Departmental Approvals

The student must have a designated graduate advisor from the CRES Department principal or affiliated faculty. The student must meet with this CRES advisor to develop a coherent plan for meeting the requirements for the designated emphasis, preferably before the end of the student's first year. This plan must be approved by the CRES department chair.

A member of the CRES principal or affiliate faculty (usually the CRES graduate advisor) must serve on the student's qualifying examination committee and on the student's dissertation committee.

Course Requirements

The student must take four relevant graduate seminars taught by CRES Department faculty. One relevant graduate seminar taught by non-program faculty may be counted with the approval of the CRES advisor. The advisor may also approve the substitution of an individual or group independent study addressing a set of readings or focused on research and writing for one of the four required graduate courses. The specific courses used must reflect a coherent plan of study that embodies both breadth and focus.

Current academic year courses recommended for the designated emphasis (DE) are listed on the CRES website, but eligible courses are not limited to this list.

Writing, Research and/or Teaching Requirements

The student must prepare a significant piece of scholarly writing in the area of CRES. This writing may take the form of a substantial seminar paper, a master's essay, or a portion of the doctoral dissertation. The student's CRES advisor will determine whether a particular piece of writing meets this requirement.

Students pursuing the designated emphasis are encouraged to serve as a teaching assistant for at least one CRES core or elective course. CRES faculty are encouraged to appoint CRES designated emphasis students as teaching assistants when possible and appropriate.

Academic Progress

Proposing and Obtaining the Designated Emphasis

Once a plan for meeting the requirements is agreed upon, the student should complete the CRES DE application, obtain the CRES advisor's and department chair's signatures, and submit the application to the CRES administrative office. The request for the designated emphasis must originate in the degree-granting department.

Once the requirements have been met, the student submits relevant documentation to the CRES administrative office for final approval by the CRES Department chair. At a minimum, the student should submit copies of the qualifying examination and/or Dissertation Committee Nomination forms and a note from the advisor confirming that the writing sample and proposed courses have been completed. If the proposed courses have changed, an explanation of the changes should be included.

The CRES administrative office will notify the student and the home department of approval for the designated emphasis.

[Optional Catchall]

Feminist Studies

415 Humanities 1
(831) 459-2461 or 459-2757
fmst@ucsc.edu

<https://feministstudies.ucsc.edu/>

PROGRAMS OFFERED

Feminist Studies B.A. (p. 112)

Feminist Studies Ph.D. (p. 117)

Feminist Studies Designated Emphasis (p. 119)

Queer and Sexuality Studies (p. 120)

Feminist studies is an interdisciplinary field of analysis that investigates how relations of gender are embedded in social,

political, and cultural formations. Founded as Women's Studies in 1974, the Feminist Studies Department at UC Santa Cruz is one of the oldest departments focused on gender and sexuality studies in the U.S. The department has contributed to the development of internationally recognized feminist scholarship. We offer an undergraduate major, a Ph.D. program, and designated emphasis. Programs in feminist studies provide students with a unique interdisciplinary and transnational perspective by emphasizing theories and practices derived from multiracial and multicultural contexts. The program emphasizes feminist modes of inquiry and is designed to provide training in feminist theories and methods. Our faculty's expertise includes critical prison studies, critical race theory, film and cultural studies, postcolonial theory, postsocialism, queer and trans studies, science and technology studies, social justice, and transnational feminism.

FEMINIST STUDIES B.A.

Information and Policies

Introduction

Feminist studies is an interdisciplinary field of analysis in the humanities that investigates how relations of gender are embedded in social, political, and cultural formations. The undergraduate program in feminist studies provides students with a unique interdisciplinary and transnational perspective. The department emphasizes theories and practices derived from multiracial and multicultural contexts. Some topics you will find in our curriculum include: Black/Africana studies; colonialism and decolonization; trans, queer, and sexuality studies; media studies; law, politics, and social change; and science and technology studies.

Feminist studies prepares undergraduates for a variety of careers. The Bachelor of Arts (B.A.) degree in Feminist Studies provides excellent grounding for undergraduates who have career aspirations in, for example, law, health, non-governmental organizations, museum curation, politics, media and film, research institutes, journalism, community organizations, and social services.

Students wishing to pursue doctoral work will also find that interdisciplinary training in feminist studies equips them with theoretical and methodological strengths in most disciplines and applied research fields including American studies, ethnic studies, science studies, anthropology, communications, and legal studies. Specialists in feminist studies are employed as consultants in industry, higher education, and human resources. State and federal government agencies employ people who have special training in understanding gender and race relations. Educational institutions need specialists to develop and administer feminist studies programs, women's centers, and other institutional structures designed specifically to study and assist marginalized peoples, including women.

Academic Advising for the Program

Email: fmst@ucsc.edu
Phone: (831) 459-1478

Feminist studies advising is held in Humanities 1, Room 415A. Drop-in hours are posted on the Feminist Studies website. Students can make an appointment by using the Slug Success application found under Resources in their student portal (MyUCSC).

Transfer students should also consult the Transfer Student Information and Policy section for specific requirements.

Getting Started in the Major

Program Learning Outcomes

Students who complete the feminist studies major should demonstrate the following skills upon graduation:

Outcome 1: Application of Feminist Approaches to Critical Interpretation

Students should be able to:

- Discuss a diversity of feminist approaches to understanding social, political, cultural, and scientific phenomena
- Connect feminist inquiry to a variety of other social phenomena including but not limited to race, nation, class, and sexuality
- Distinguish and evaluate assumptions underlying data and claims
- Place divergent interpretive frameworks in dialogue
- Perform close reading of texts and/or other objects

Outcome 2: Original Research

Students should be able to:

- Develop specific and detailed research questions
- Identify appropriate primary sources for feminist research projects
- Collect, evaluate, and analyze source material using appropriate theoretical framework(s)
- Identify key findings and draw conclusions for research and/or application

Outcome 3: Argumentative Communication

Students should be able to:

- Effectively formulate written arguments to frame research questions and analyze source material
- Present appropriate evidence to substantiate claims
- Logically organize arguments over the course of a research paper
- Use appropriate mechanics/grammar

Major Qualification Policy and Declaration Process

Major Qualification

Undeclared students may declare the feminist studies major at any time. While specific courses are not required in order to declare, students ideally will have completed or be enrolled in FMST 1, Feminist Studies: An Introduction.

Appeal Process

How to Declare a Major

For a single major, complete the Petition for Major Declaration form and sign it. For a double major or major/minor, complete both the Major Declaration form and also an Academic Planning form. Both of these forms must be signed by you and by each departmental advisor.

Familiarize yourself with the content of the Feminist Studies website. Schedule a meeting with the feminist studies advisor during which you will fill out an online feminist studies major requirements worksheet, develop a curriculum plan, and officially declare the major.

If your proposed program exceeds your expected graduation term (EGT), you must visit your college for review and approval of extension of enrollment.

Students should submit a petition to declare as soon as they reach their declaration deadline quarter.

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter.

Transfer Information and Policy

Transfer Admission Screening Policy

No major preparation courses are required prior to transfer. Prospective students are encouraged to complete the Intersegmental General Education Transfer Curriculum (IGETC) or to complete all UC Santa Cruz general education requirements before matriculation.

Getting Started at UCSC as a Transfer Student

Transfer students are encouraged to declare the major as soon as possible to be assured entrance into the required core courses. Please see the section How to Declare a Major for more details.

Transfer students may use an articulated equivalent of FMST 1 to satisfy the FMST 1 requirement. Please check assist.org for current articulation agreements.

If you have completed prior college-level coursework in feminist studies, women's studies, or a similar field of study, please contact feminist studies advising as soon as possible and provide a copy of your unofficial transcript and course

syllabi so the coursework can be reviewed for potential fulfillment of feminist studies major requirements.

The Feminist Studies Department will consider, upon petition, which UC-transferrable courses from other institutions are acceptable. FMST 1, one feminist studies (FMST) lower-division course, and FMST 100 must be completed before the senior year so that the comprehensive requirement may be completed in the senior year.

Transfer students are strongly encouraged to enroll in FMST 105, Feminist Methodologies, a course designed specifically to aid in the transition to UCSC's feminist studies major for incoming transfer students. FMST 105 is offered every fall. This course will also satisfy the one upper-division core course requirement.

FMST 105	Feminist Methodologies	5
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Letter Grade Policy

Letter grades are required for 10 of the 11 courses applied toward the feminist studies major. FMST 100 and the comprehensive requirement course (FMST 194 or FMST 195) must be taken for a letter grade.

[Optional Catchall]

Course Substitution Policy

Feminist studies is an interdisciplinary major that includes courses taught by affiliated faculty in other departments (see the Courses page of the Feminist Studies website for current year offerings). However, feminist studies majors must take a minimum of five courses at UC Santa Cruz taught directly in the Feminist Studies Department, (i.e., courses designated FMST, not including FMST 193, FMST 198, or FMST 199). At most three courses may be transferred to count toward the major, including three Education Abroad Program (EAP) courses or courses from another university.

Double Majors and Major/Minor Combinations Policy

The feminist studies major works very well as a double major with fields of study such as community studies, critical race and ethnic studies, sociology, politics, education, legal studies, literature, psychology, and more.

Study Abroad

As stated in the course substitution policy, a maximum of three courses may be transferred to count toward the major, including courses from an Education Abroad Program (EAP).

Honors

Feminist studies awards honors and highest honors in the major. At the end of each quarter, a faculty committee meets to review graduating students' files. Students are considered for honors and highest honors based on their cumulative GPA, calculated from grades earned in coursework and the comprehensive requirement undertaken for completion of the major. For honors, students must earn a minimum GPA of 3.70 in the relevant courses, while for highest honors, the GPA must

be 3.90 or higher. Writing a thesis is not a requirement for receiving honors or highest honors.

[Optional Catchall]

Requirements and Planners

Course Requirements

Feminist studies majors must complete 11 courses including a comprehensive requirement in the Feminist Studies Department program. The three core courses--FMST 1, one lower-division feminist studies course, and FMST 100--must be taken at UC Santa Cruz absent a petition. A minimum of five courses at UCSC taught directly in the Feminist Studies Department, (i.e., courses designated FMST, not including FMST 193, FMST 198, or FMST 199) must be completed for the major.

Lower-Division Courses

Take the following course:

FMST 1	Feminist Studies: An Introduction	5
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And one of the following courses:

FMST 10	Feminisms of/and the Global South	5
FMST 13	California Indian History	5
FMST 14	Popular Culture in South Asia	5
FMST 15	Gender, Sexuality, and Transnational Migration Across the Americas	5
FMST 16	Media Histories--News and New Media	5
FMST 18	Black Feminist Ethnographies	5
FMST 20	Feminism and Social Justice	5
FMST 21	Religion in American Politics and Culture	5
FMST 30	Feminism and Science	5
FMST 31	Disability Studies	5
FMST 40	Sexuality and Globalization	5
FMST 41	Trans Gender Bodies	5

Upper-Division Courses

FMST 100	Feminist Theories	5
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Students are required to complete FMST 100, Feminist Theories, at UC Santa Cruz absent a petition.

Electives

Students are required to complete seven upper-division (100-199), 5-credit electives. One independent study (FMST 199) may count toward the elective requirements. FMST 193 or FMST 198 (internship) may be used to count toward the elective requirements.

Feminist studies is an interdisciplinary major that includes courses taught by affiliated faculty in other departments (see the Courses page of the Feminist Studies website for current year offerings). However, as noted elsewhere, feminist studies majors must take a minimum of five courses at UC Santa Cruz taught directly in the Feminist Studies Department, (i.e.,

courses designated FMST, not including FMST 193, FMST 198, or FMST 199). At most three courses may be transferred to count toward the major, including three Education Abroad Program (EAP) courses or courses from another university.

The Feminist Studies Tentative Curriculum is the definitive list of courses offered during the current academic year that will satisfy major requirements and is comprised of courses offered both from within the Feminist Studies Department but also with approved courses originating from many different departments throughout UC Santa Cruz.

Please consult feminist studies advising with any questions regarding this requirement.

FMST 102	Feminist Critical Race Studies	5
FMST 105	Feminist Methodologies	5
FMST 112	Women and the Law	5
FMST 115	Gender, Sexuality, and Transnational Migration Across the Americas	5
FMST 117	Post Zora Interventions: Art, Activism and Anthropology	5
FMST 119	Indigenous Feminisms	5
FMST 120	Transnational Feminisms	5
FMST 123	Feminism and Cultural Production	5
FMST 124	Technology, Science, and Race Across the Americas	5
FMST 125	Race, Sex, and Technology	5
FMST 126	Images, Power, and Politics: Methods in Visual and Textual Analysis	5
FMST 131	The Politics of Matter and the Matter of Politics	5
FMST 132	Gender and Postcoloniality	5
FMST 133	Science and the Body	5
FMST 135	Topics in Science and Sexuality	5
FMST 139	African American Women's History	5
FMST 145	Racial and Gender Formations in the U.S	5
FMST 150	Mediating Desire	5
FMST 175	Gender and Sexualities in Latina/o America	5
FMST 188	Topics in Feminist Studies	5
FMST 189	Advanced Topics in Feminist Theory	5
FMST 193	Field Study	5
FMST 198	Independent Field Study	5
FMST 199	Tutorial	5

Approved Electives in Affiliated Departments

For a list of approved electives for the current year, see the Feminist Studies Tentative Curriculum list.

Division of the Humanities

APLX 112	Language and Gender	5
CRES 100	Comparative Theories of Race and Ethnicity	5

CRES 101	Research Methods and Writing in Critical Race and Ethnic Studies	5	Division of Social Sciences		
HIS 106B	Asian and Asian American History, 1941-Present	5	ANTH 110G	Westside Stories: Race, Place and the California Imaginary	5
HIS 109A	Race, Gender, and Power in the Antebellum South	5	ANTH 110Q	Queer Sexuality in Black Popular Culture	5
HIS 110A	Colonial America, 1500-1750	5	ANTH 110T	Motherhood in American Culture	5
HIS 112	American Feminist Thought, 1750-1950	5	ANTH 130E	Culture and Politics of Island Southeast Asia	5
HIS 113C	Women and American Religious Culture	5	ANTH 130F	Blackness In Motion: Anthology of the African Diasporas	5
HIS 121B	African American History: 1877 to the Present	5	ANTH 130L	Ethnographies of Latin America	5
HIS 128	Chicana/Chicano History	5	ANTH 130O	Native Feminisms, Gender, and Settler Colonialism	5
HIS 131	Women in Colonial Latin America	5	ANTH 131	Gender in Cross-Cultural Context	5
HIS 140C	Revolutionary China 1895-1960	5	ANTH 134	Medical Anthropology: An Introduction	5
HIS 140D	Recent Chinese History	5	ANTH 140	The Body in Rain: Environmental and Medical Intersections	5
HIS 140E	Women in China's Long 20th Century	5	ANTH 148	Gender and Global Development	5
HIS 145	Gender, Colonialism, and Third-World Feminisms	5	ANTH 158	Feminist Ethnographies	5
HIS 150F	Engendering Empires: Women in Modern Japan and Korea	5	ANTH 160	Reproductive and Population Politics	5
HIS 151A	Medicine and the Body in the Colonial World	5	ANTH 194M	Medical Anthropology	5
HIS 159B	Women and Gender in Ancient Egypt	5	ANTH 194X	Women in Politics: A Third World Perspective	5
HIS 194A	Gender, Class, and Sex in Shanghai	5	CMMU 151	Sex, Race, and Globalization	5
HIS 196H	Sex and the City--The History of Sexuality in Urban Areas Around the Globe	5	CMMU 161	Gender Health and Justice	5
HISC 113	History of Capitalism	5	EDUC 135	Gender and Education	5
HISC 125	Queerness and Race	5	ECON 183	Women in the Economy	5
LIT 112P	Gwendolyn Brooks	5	LALS 144	Mexicana/Chicana Histories	5
LIT 121M	Blue and Brown: Race, Gender, and Blackness	5	LALS 172	Visualizing Human Rights	5
LIT 121O	Body Theories and Embodied Poetics in Contemporary American Poetry	5	LALS 175	Migration, Gender, and Health	5
LIT 146G	Queer(y)ing Victorian Literature	5	LGST 111B	Civil Liberties	5
LIT 156A	The Gothic Imagination in Fiction, Film, and Theory	5	POLI 103	Feminist Interventions	5
LIT 161B	African American Women Writers	5	POLI 105B	Early Modern Political Thought	5
LIT 162C	So Many Little Lives: Representations of Trauma in Asian American Literature	5	PSYC 107	Gender and Development	5
LIT 166A	Representations of Gender in Medieval Literature	5	PSYC 140G	Women's Lives in Context	5
LIT 166E	Women's Literature	5	PSYC 140H	Sexual Identity and Society	5
LIT 167E	The Vampire in Literature and Popular Culture	5	PSYC 140L	Women's Bodies and Psychological Well-Being	5
PHIL 147	Topics in Feminist Philosophy	5	PSYC 140Q	Social Psychology of Gender	5
			PSYC 140T	Psychology of Trauma	5
			PSYC 149	Community Psychology: Transforming Communities	5
			PSYC 153	The Psychology of Poverty and Social Class	5
			PSYC 159A	Sexual Identity	5
			PSYC 159D	Psychology of Sexual Aggression	5
			SOCY 111	Family and Society	5
			SOCY 120	Gender, Race/Ethnicity, Sexuality and Cultural Politics	5
			SOCY 121	Sociology of Health and Medicine	5

SOCY 126	Sex and Sexuality as Social Practice and Representation	5
SOCY 132	Sociology of Science and Technology	5
SOCY 145	Sociology of Masculinities	5
SOCY 149	Sex and Gender	5
SOCY 150	Sociology of Death and Dying	5
SOCY 152	Body and Society	5
SOCY 157	Sexualities and Society	5
SOCY 156	U.S. Latinx Identities: Centers and Margins	5
SOCY 158	Politics of Sex Work and Erotic Labor	5
SOCY 172	Sociology of Social Movements	5
SOCY 176	Women and Work	5
SOCY 187	Feminist Theory	5

Division of the Arts

FILM 130	Silent Cinema	5
FILM 165A	Film, Video, and Gender	5
FILM 165B	Race on Screen	5
FILM 165C	Lesbian, Gay, and Queer Film and Video	5
FILM 165D	Asian Americans and Media	5
FILM 165E	Chicana/o Cinema, Video	5
FILM 165G	Gender and Global Cinema	5
FILM 194E	International Cinemas	5
HAVC 115	Gender in African Visual Culture	5
HAVC 140C	Race and American Visual Arts	5
HAVC 141F	The Camera and the Body	5
HAVC 170	Art of the Body in Oceania	5
HAVC 172	Textile Traditions of Oceania	5
HAVC 186	Horror and Gender in Art and Visual Culture	5
HAVC 186Q	Queer Visual Culture	5
THEA 161M	Sexuality, Gender, Drama, and Performance	5
THEA 161T	Women in Theater	5

The Colleges

CLTE 135	Apprenticeship in Community Engaged Research	5
OAKS 150	Queer History and Theory in the United States	5

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement in feminist studies is satisfied by completing the comprehensive requirement (FMST 194 or FMST 195).

Comprehensive Requirement

Comprehensive requirement options include a senior seminar taught by core faculty or a senior thesis/project. Completion of the Entry Level Writing and Composition Requirements are prerequisites to FMST 194 and FMST 195.

Students who wish to complete FMST 195, Senior Thesis or Project, should consult early with the feminist studies advisor and a prospective faculty advisor. The senior thesis or project option is by petition only, and faculty advisors may request that students complete a Senior Seminar (FMST 194) before agreeing to supervise a senior thesis or project.

Double majors may be able to write a thesis of 50 or more pages over three quarters to satisfy the comprehensive requirements of feminist studies and the second major. The Feminist Studies Department will review and approve or deny proposals for a double thesis on a case-by-case basis.

Students should be aware that not all departments will accept a double thesis. Students who wish to propose a double thesis should consult with both major advisors before the end of their junior year. Such a proposal must be approved by both departments or referred to the Committee on Educational Policy. In evaluating such proposals, the departments will require the student to have completed significantly more work than the minimum required for the comprehensive requirement of each major. The student's work must clearly explain to the reader the relevance of the work to both disciplines.

FMST 194A	Feminist Jurisprudence	5
FMST 194B	Queer/Feminist Historiography	5
FMST 194C	Gender and Iconicity	5
FMST 194D	Feminist Science Studies	5
FMST 194F	Chicana/Latina Cultural Production	5
FMST 194G	Images of Africa	5
FMST 194H	Michel Foucault: An Introduction	5
FMST 194I	Feminist Oral History and Memoir	5
FMST 194K	Black Diaspora	5
FMST 194L/CRES 10/CRES 100	Comparative Settler Colonial Studies	5
FMST 194M/CRES 10/CRES 100	Empire and Sexuality	5
FMST 194O	The Politics of Gender and Human Rights	5
FMST 194Q/CRES 10/CRES 100	Queer Diasporas	5
FMST 194T	Transgender Studies	5
FMST 194U	Touring War and Empire	5
FMST 194V	Marxism and Feminism	5
FMST 194W	Politics of Space, Time, and Matter	5
FMST 195	Senior Thesis or Project	5
CRES 190A	Critical Race Feminisms	5
HIS 194N	Urbanites in the Global South, 18th Century to the Present	5

Planners

Four Year Plan

	Fall	Winter	Spring
1st (frosh)			
2nd (soph)	FMST 1	FMST 100	FMST lower-division core
3rd (junior)	FMST elective	FMST elective FMST elective	FMST elective
4th (senior)	FMST elective FMST elective	FMST 194 or FMST 195	FMST elective

FMST 01 fulfills the CC general education (GE) requirement. Many FMST courses fulfill other GE requirements.

Two Year Plan for Transfer Students:

	Fall	Winter	Spring
3rd (junior)	FMST 1	FMST 100	FMST elective
	FMST lower-division core		FMST elective
	FMST elective*		
4th (senior)	FMST elective	FMST elective	FMST 194 or 195
	FMST elective	FMST elective	

*Transfer students are strongly encouraged to enroll in FMST 105, Feminist Methodologies, a course designed specifically to aid in the transition to UCSC's feminist studies major for incoming transfer students. FMST 105 is offered every fall. This course will also satisfy one FMST elective requirement.

FEMINIST STUDIES PH.D.

Admissions to the Feminist Studies Ph.D. program is suspended for the 2021-22 year.*

Introduction

The Department of Feminist Studies at the University of California, Santa Cruz welcomed its inaugural class of students who began studies toward a Doctor of Philosophy degree (Ph.D.) in Feminist Studies in Fall 2013. The Ph.D. in feminist studies at UC Santa Cruz is an interdisciplinary program that investigates how relations of gender are embedded in social, political, racial, and cultural formations. The program emphasizes feminist modes of inquiry and provides students with advanced training in feminist methods. It fosters a rethinking of the relationships between knowledge, power, and expertise. Conceived as a collaborative, cross-divisional enterprise, this graduate program draws upon the strengths of a range of feminist scholars and their departments and programs across the university.

***Revised:** 7/15/21

Advancement to Candidacy

Students are expected to take the Ph.D. qualifying examination in their third year and no later than their fourth year, by which point they also must fulfill the course requirements and demonstrate proficiency in a second language.

Course Requirements

Ph.D. students will complete most of their coursework during their first two years. Students are required to complete a total of 12 courses: three required courses on Feminist Theories (FMST 200), Feminist Methodologies (FMST 201), and Disciplining Knowledge (FMST 202) and nine electives. Feminist studies requires FMST 200 and FMST 201 to be taken consecutively the fall and winter quarters of the first year, while FMST 202 will be offered in the spring of the second year.

In addition, students must enroll in three 2-credit advising courses (FMST 297F) with their first-year mentor or primary advisor. FMST 290, a 2-credit pedagogy training course, is to be taken prior to and/or in conjunction with the first teaching assistant appointment.

FMST 200	Feminist Theories	5
FMST 201	Topics in Feminist Methodologies	5
FMST 202	Disciplining Knowledge/Graduate Research	5

Elective Courses

Students may take elective courses in feminist studies as well as in other departments. Graduate seminars, independent studies, and directed readings in the Feminist Studies Department count toward the elective course requirement. Graduate seminars from other departments may also be used to fulfill the elective requirement.

FMST 203	Feminist Pedagogies	5
FMST 207	Topics in Queer/Race Studies	5
FMST 211	Sexuality, Race, and Migration in the Americas	5
FMST 212	Feminist Theory and the Law	5
FMST 214	Topics in Feminist Science Studies	5

FMST 215	Postcolonial and Postsocialist Transactional Analytics	5
FMST 216	Archives/Genders/Histories: An Introduction	5
FMST 218	Militarism and Tourism	5
FMST 222	Religion, Feminism, and Sexual Politics	5
FMST 232	Topics in Postcolonial Studies	5
FMST 243	Feminism, Race, and the Politics of Knowledge	5
FMST 260	Black Feminist Reconstruction	5
FMST 270	Anthropology at Its Interfaces with Feminist, Postcolonial, and Decolonial STS	5

must be members of the Feminist Studies Department. The graduate dean has authority to approve committee nominations and grant authorities.

The qualifying examination focuses on the student's research project and on the fields of scholarship it presupposes. The qualifying examination consists of:

1. Written Portion (75-95 pages total)
 - a. Introduction to the Qualifying Exam (15-20p): This document explains the intellectual trajectory of the student, the development of the student's research questions, and the relationship between the different written components submitted for the exam.
 - b. Qualifying Essay(s) (50-60p): In consultation with the advisor, the student will submit one or two research essays totaling 50-60 pages. Depending on the nature of the student's project and method, as well as the advisor's preferences concerning the exam format, the Qualifying Essay(s) may consist of article- or chapter-length research paper(s), literature review(s), and/or field statement(s) related to the student's primary areas of research.
 - c. Dissertation Prospectus (10-15p): A draft dissertation prospectus is due at the time of exam. A revised prospectus will be due to the committee no later than the end of the quarter following the oral exam. The prospectus outlines the primary research questions, fields of intervention, timeline, and potential claims of the dissertation project.
2. Oral Examination
 - a. The oral examination typically lasts 2.5-3 hours. The student is invited to give a 10-minute introduction to the qualifying essay and research project. Each examiner on the QE Committee will have approximately 20-30 minutes to put questions to the student regarding the written portion of their examination. A general discussion typically follows the round-robin questioning. Upon completion of the questions and discussion, the student is excused and the committee members evaluate the student's performance with the goal of achieving some unanimity. The committee invites the student back to the room to share the group's evaluation, offer advice, and articulate any requirements. The committee will also suggest revisions to the dissertation prospectus, to be completed by the end of the quarter following the oral exam.
 - b. The chair of the committee composes a final report based on the committee's evaluation of the student's performance. After approval by the other committee members, the report is submitted to the Graduate Division to recommend advancement to candidacy.

Foreign Language Requirements

Students normally satisfy the language requirement by the end of the second year; the requirement must be satisfied in order to pass the qualifying exam. Fulfillment of the language requirement in feminist studies can be documented in several ways. The documentation should demonstrate current ability to use the language in an appropriate way in scholarship. The language appropriate to research could be oral, gestural, or written, or a combination of these. Depending on the specific language and on the research needs of the student, functional language competence could include the ability to read the scholarly literature or other written material needed in research, the ability to conduct fieldwork in the language, or the ability to produce written work in the language. Students should discuss their language requirement with their faculty advisor who, along with the graduate director, has responsibility for determining whether a student has satisfied the requirement. If neither the advisor nor the graduate director have proficiency in the proposed language, then an outside person will be consulted to verify competency in the proposed language. According to Graduate Division policy, proficiency should be demonstrated **before** the qualifying examination committee can be appointed and at least one month prior to taking the qualifying examination.

Teaching Requirement

Pre-Qualifying Requirements

Qualifying Examination

Advancement to candidacy depends on the general quality of a student's work; demonstration of proficiency in a foreign language relevant to the student's area of work, either by passing a written examination administered by the department or successfully completing a language course approved by the department; success in the qualifying examination, and proposal of an acceptable dissertation topic.

Students should consult their advisor when composing their qualifying examination committee. Per Academic Senate policy, committees must consist of at least four members, one of whom is not a member of the student's department. The chair of the committee must be tenured, and will not be the student's dissertation advisor. The outside member must be a tenured faculty member, or may be from a non-academic field. The department requires that at least two members of the committee

Post-Qualifying Requirements

Immediately after the qualifying examination, students will consult their primary advisor to convene a Dissertation Committee. The Dissertation Committee must be composed of at least three members, the majority of whom must be members of the UC Santa Cruz Academic Senate, and at least one of whom is a member in Feminist Studies. Advancement to candidacy will only take place after a committee is approved by the graduate dean.

Award of Master's Degree

The department admits students only for the Ph.D. program. However, in exceptional circumstances, for example, if a student has to leave the program before completing the Ph.D., the Master of Arts (M.A.) degree in Feminist Studies may be conferred. In consultation with the advisor and graduate director, the M.A. requirements are as follows:

1. Completion of nine graduate seminars, including FMST 200, FMST 201, and FMST 202 to the satisfaction of the department. The remaining six seminars are to be selected from the department offerings to reflect the student's particular academic plan, agreed upon by the student and graduate advisor.
2. Successful completion of the qualifying examination, including all written and oral components.
3. Completion of the master's degree cannot be accomplished in less than two full academic years.

Students who wish to petition for the M.A. degree in Feminist Studies must meet all guidelines for the degree established by the Graduate Division and petition for the degree prior to the due date set by the division. Upon successful completion of the qualifying examination, students must submit the completed qualifying examination written materials to the department as the final portfolio of work for the degree.

[Optional Catchall]

Dissertation

Dissertation

After advancement to candidacy, expected by the end of the third year, students take courses in the 290 sequence (FMST 299A) until the dissertation is submitted. Successful revision of the dissertation prospectus will be due to the Dissertation Committee no later than the end of the quarter after completion of the oral examination to remain in good academic standing. Students submit the revised prospectus to their committee for approval and transmit the document to the graduate coordinator.

Upon approval of the revised dissertation prospectus, students concentrate on dissertation writing. The current normative time to degree limit is six years, although students should plan dissertation research and writing timelines keeping in mind the funding commitments made by the department at the time of matriculation. Students also have the option of doing advanced work in a traditional discipline and receiving a Designated Emphasis of this specialization. In such cases, students must

satisfy the appropriate department's criteria (see the departmental web site for information). Students are expected to complete at least one year of supervised teaching as part of the degree requirements.

Dissertation Defense

The dissertation defense serves as the final opportunity for the student to receive focused feedback on research and writing, ideally with the goal of developing the dissertation into a book or other major project following completion of the Ph.D. The defense typically lasts two hours and is an occasion for thoughtful, constructive criticism and guidance; it is not an examination. For this reason, the defense will normally be conducted as a closed meeting between the committee and the student, along with a small audience of guests invited by the student and/or advisor. The student may elect to conduct a public defense with permission of the advisor. In such instances, the chair must convene a closed committee discussion at the end of the defense to complete conferral of the Ph.D.

Academic Progress

Normative time to completion of the Ph.D. is six years. Upon advancement to candidacy, students are expected to complete the dissertation within three years to make satisfactory academic progress.

Applying for Graduation

At the end of the dissertation writing process, the student must petition for the degree, format the dissertation according to Graduate Division guidelines, complete an oral dissertation defense with the Dissertation Committee, and obtain signatures of the committee members on the official title page. Once these items are complete, the student may file the dissertation to complete the Ph.D.

[Optional Catchall]

FEMINIST STUDIES DESIGNATED EMPHASIS

Introduction

Graduate students may work toward a Doctor of Philosophy (Ph.D.) degree that notes a designated emphasis in feminist studies on the graduation documents. Students wishing to pursue this option should consult with the chair of their respective Ph.D. program and are encouraged to apply in the first or second year of graduate study. The application and an annually updated list of regularly offered, approved graduate courses are available at the Feminist Studies website.

Requirements

The following are required for the designated emphasis:

Committee Composition and Departmental Approvals

The student must have a designated graduate advisor from the feminist studies core faculty who serves on the qualifying examination committee or in some other appropriate capacity.

Course Requirements

The student must take four graduate courses in feminist studies, two of which must be taught directly in the department. Two courses can be selected from among the graduate offerings of any UC Santa Cruz department, as long as they are taught by core or affiliated feminist studies faculty.

FMST 200	Feminist Theories	5
FMST 201	Topics in Feminist Methodologies	5
FMST 202	Disciplining Knowledge/Graduate Research	5
FMST 203	Feminist Pedagogies	5
FMST 207	Topics in Queer/Race Studies	5
FMST 211	Sexuality, Race, and Migration in the Americas	5
FMST 212	Feminist Theory and the Law	5
FMST 214	Topics in Feminist Science Studies	5
FMST 215	Postcolonial and Postsocialist Transactional Analytics	5
FMST 216	Archives/Genders/Histories: An Introduction	5
FMST 218	Militarism and Tourism	5
FMST 222	Religion, Feminism, and Sexual Politics	5
FMST 232	Topics in Postcolonial Studies	5
FMST 243	Feminism, Race, and the Politics of Knowledge	5
FMST 260	Black Feminist Reconstruction	5
FMST 270	Anthropology at Its Interfaces with Feminist, Postcolonial, and Decolonial STS	5

Courses in Other Departments

Courses in other departments that satisfy the DE requirement when taught by affiliated faculty include:

ANTH 231	Intimacy and Affective Labor	5
ANTH 232	Bodies, Knowledge, Practice	5
ANTH 234	Feminist Anthropology	5
ANTH 238	Advanced Topics in Cultural Anthropology	5
ANTH 243	Cultures of Capitalism	5
ANTH 249	Ecological Discourses	5
ANTH 255	Regulating Religion/Sex	5
ANTH 260	Anthropology of Freedom	5
FILM 226	Queer Theory and Global Film and Media	5
FILM 284	Film, Culture, and Modernity	5
HAVC 245	Race and Representation	5
HIS 204A	History of Gender Research Seminar	5
HIS 205	Diaspora and World History	5
HIS 215A	Topics in American History: U.S. Labor and Working Class History	5

HIS 221	Empires and New Nations in the Americas	5
HIS 227	Gender and Colonialism	5
HIS 230B	Engendering China	5
HIS 230C	Readings in 20th-Century China	5
HIS 231	Historicizing the People's Republic of China	5
HIS 243	Transnational Japan	5
HIS 244	Gender and Japanese History	5
LALS 210	Latina Feminisms: Theory and Practice	5
LALS 215	Latina Cultural Studies: Culture, Power, and Coloniality	5
LALS 240	Culture and Politics of Human Rights	5
LALS 242	Globalization, Transnationalism, and Gender in the Americas	5
LIT 230C	Feminist Theories/Historical Perspectives	5
LIT 231A	Studies in Literary and Cultural History	5
LIT 250	Theory and Methods	5
LIT 251	Topics in Cultural Studies	5
MUSC 254K	Music, Gender, and Sexuality	5
POLI 204	Bodies in History	5
PSYC 210	The Experimental Method in Social Psychology	5
PSYC 247	Special Topics in Developmental Psychology	5
PSYC 251	Feminist Theory and Social Psychology	5
PSYC 254	Psychology of Gender	5
PSYC 256	Psychology of Social Class and Economic Justice	5
PSYC 264	Transnational Feminism, Development, and Psychology	5
SOCY 240	Inequality and Identity	5
SOCY 245	Feminist Theory	5
SOCY 249	Feminisms and Cultural Politics	5
SOCY 255	Engaging Cultural Studies	5
SOCY 264	Science, Technology, and Medicine	5

Writing, Research and/or Teaching Requirements

The student must prepare a significant piece of writing in the area of feminist studies. This writing may be a master's essay, qualifying examination essay, or a chapter of the doctoral dissertation.

[Optional Catchall]**Queer and Sexuality Studies**

415 Humanities 1
 fmst@ucsc.edu
<https://qss.ucsc.edu/>
<https://language.ucsc.edu>

Scholarship pertaining to the critical study of gender and sexuality can be found across a broad range of departments at UCSC. This presence is manifested in a diverse faculty, in course offerings, and in research programs. Courses with queer content can be found across a broad range of departments, programs, and colleges at UCSC.

For more specialization, departments such as Feminist Studies and Literature have sufficient flexibility to allow students to design a course of study within those majors to explore these interests. For students who prefer to take a more self-directed approach, there is the option of designing an individual major.

Research activities are sponsored by the Queer Theory research cluster (a part of the Center for Cultural Studies), the Queer and Sexuality Studies Working Group, and many campus departments and student organizations.

The Lionel Cantú GLBTI Resource Center serves as a clearinghouse for queer activities on the UCSC campus. Each quarter, the center prepares a list of all course offerings with queer content. Information is available at the Lionel Cantú Queer Center website or via e-mail to queer@ucsc.edu.

More information may be obtained from members of the faculty working group: Anjali Arondekar (Feminist Studies), Carla Freccero (Literature, Feminist Studies, History of Consciousness), Irene Gustafson (Film and Digital Media), Marcia Ochoa (Feminist Studies), B. Ruby Rich (Film and Digital Media). Additional faculty contacts: Julie Bettie (Sociology), Benjamin Carson (Music), Sheila Crane (History of Art and Visual Culture), Jody Greene (Literature, Feminist Studies), Herbert Lee (Applied Mathematics and Statistics), Peter Limbrick (Film and Digital Media), Catherine S. Ramírez (Latin American and Latino Studies), Jenny Reardon (Sociology), Lisa Rofel (Anthropology), Danny Scheie (Theater Arts), Daniel Selden (Literature), Elizabeth Stephens (Art).

Please contact Marcia Ochoa (marcia8a@ucsc.edu) or Anne Eickelberg (aeickelb@ucsc.edu) in the department of Feminist Studies in the Humanities Division for information about course offerings and resources.

History

201 Humanities
(831) 459-2982
<https://history.ucsc.edu/>

For Classical Studies

<https://classicalstudies.ucsc.edu/>

For East Asian Studies

<https://eastasianstudies.ucsc.edu/>

For Jewish Studies

<https://jewishstudies.ucsc.edu>

PROGRAMS OFFERED

History B.A. (p. 122)

History Minor (p. 130)

Classical Studies B.A. (p. 130)

Classical Studies Minor (p. 134)

East Asian Studies Minor (p. 134)

Jewish Studies B.A. (p. 136)

Jewish Studies Minor (p. 140)

History M.A. (p. 141)

History Ph.D. (p. 142)

Greek (p. 130)

Latin (p. 130)

UNDERGRADUATE PROGRAM

History is the stories humans tell about the past. For professional historians, those stories are based on evidence that is carefully collected and rigorously interpreted. Both the evidence and interpretation are passionately debated in the classroom, in articles and books, and in the public sphere. This makes history a dynamic enterprise. Students of history ask new questions, find new evidence, incorporate more voices, and reconsider old assumptions. Studying history enriches our understanding of the world by deepening our knowledge of the past and by pushing us to ask new questions that provide insight into our own time. Our History Department is committed to helping students learn to think historically, which entails asking not just what happened, but why it happened the way it did.

Thinking historically cultivates the empathy and imagination necessary to understand multiple perspectives on events both past and present.

It is impossible to understand the world we inhabit, including its complex global conflicts, climatic transformations, and fundamental shifts in understandings of individual identity, without history. Yet, as much as history can illuminate the present, its study also requires recognizing that often, "the past is a foreign country," where words, ideas, and even bodies themselves operate on radically unfamiliar terms. Our department's strengths in transnational, gender, environmental, cultural, and social history, including critical race and ethnic studies, enable students to engage in a variety of approaches to studying history.

This training equips students to be engaged citizens and prepares them for a wide range of careers. History majors develop skills in critical reading, effective research, analytical thinking, and clear, persuasive communication. Such skills are the essential foundation for jobs directly connected with the field, like teaching, research, and working in public history venues such as museums, archives, and libraries. These skills are also invaluable to careers in law, business, government, foreign service, management, publishing, journalism, social media, and many other areas. The ability to identify and access salient information, evaluate it critically, and use it to engage in constructive debate is essential for navigating a complex, dynamic, and global world.

GREEK

The History Department offers instruction in elementary ancient Greek. It consists of a two-course sequence, GREE 1 and GREE 2, that begins in the fall quarter only. Students interested in Greek literature should see the course listings under Literature. Those interested in classical studies should see the program description for classical studies.

Campus Language Laboratories and Placement Exams

No placement examination is required for entry into GREE 1. Contact the History Department for more information about these topics.

LATIN

The History Department offers instruction in elementary Latin. It consists of a two-course sequence, LATN 1 and LATN 2, that begins in the fall quarter only. Students interested in Latin literature should see the course listings under Literature. Those interested in classical studies should see the program description for classical studies.

Campus Language Laboratories and Placement Exams

No placement exam is required for entry into LATN 1. Contact the History Department for more information about these topics.

GRADUATE PROGRAM

The Ph.D. program in history at UCSC emphasizes an interdisciplinary and cross-cultural approach to historical studies. The History Department offers a rigorous program of instruction and independent work that trains students in the techniques of original historical research and equips them to teach university-level courses in history. The department only admits those highly motivated students who are most qualified to pursue advanced studies in history. The department also only admits those applicants who can best benefit from the specific strengths of our faculty. Just as the work of most professional historians centers around research and teaching, training in these areas constitutes the two essential poles of the graduate program in history.

HISTORY B.A.

Information and Policies

Introduction

History is about the past, but it is also about understanding the world we live in today. Our faculty seek to understand and help you understand how the challenges that confront us today like economic inequality, environmental degradation, and racism developed and changed over time. We also explore the patterns of social movements and political transformation that help us understand how people change the world.

Students often think of studying history as a matter of memorizing names and dates. While having a command of

basic facts is important, college-level study of history shifts the focus to learning how to ask illuminating questions about the past. UC Santa Cruz history majors cultivate a broad understanding of human history across time and space and develop deep knowledge of a particular region of the world. At the same time, they learn how to ask transformative questions, develop their ability to answer them through effective research, and convey their ideas clearly and persuasively through strong communication skills.

Students and their parents alike often express the sentiment that history is fascinating, but sometimes raise questions about its practicality as a college major. However, substantial research demonstrates that history majors thrive in their careers, and employers often express a need for the skills that studying history instills. A history major isn't just fascinating; it's a path to success. History majors develop skills in critical reading, effective research, analytical thinking, and clear, persuasive communication. Such skills are the essential foundation for jobs directly connected with the field, like teaching, research, and working in public history venues such as museums, archives, and libraries. These skills are also invaluable to careers in law, business, government, foreign service, management, publishing, journalism, social media, and many other areas. The ability to identify and access salient information, evaluate it critically, and use it to engage in constructive debate is essential for navigating a complex, dynamic, and global world. Visit our website for selected reports on the value of the history major.

Academic Advising for the Program

Academic advising is an important part of your undergraduate education. The History Department undergraduate program coordinator can help you clarify your educational goals, select classes that complement your academic interests and develop an individualized plan of study. The undergraduate program coordinator can also help you identify faculty mentors and enrichment opportunities within and related to your major.

Advising is held in Humanities 1, room 201. Undergraduate advising email contact: historyundergrad@ucsc.edu

Transfer students are encouraged to additionally consult the "Transfer Information and Policy" information included below.

Getting Started in the Major

Four-year students considering the history major are encouraged to enroll in at least one lower-division history course during their first year. These offer a broad sweep of a historical period and give students a sense of how studying history in college differs from studying it in high school. Students are encouraged but not required to take three lower-division history courses, one from each of the three regions of concentration, during the first year. Taking courses from each of the three regions of concentration during the first year helps students decide on a concentration as their area of focus and clarify their educational goals (see the Regions of Concentration section below for more information).

Program Learning Outcomes

Students who complete the history major graduate with the following:

History

- Understanding of a basic narrative of historical events in a specific region of the world.

Critical Reading

- The ability to distinguish primary and secondary sources.
- The ability to evaluate historical ideas, arguments, and points of view.
- The ability to evaluate competing interpretations and multiple narratives of the past.

Research and Evidence

- The ability to gather and assess primary historical evidence.
- The ability to compile a bibliography.

Communication

- The ability to present clear and compelling arguments, based on critical analysis of diverse historical sources, and effectively communicate your interpretations in written essays and/or other media.
- The ability to develop a research question and complete a well-supported piece of historical writing about it.

Scope and Thematics

- Through completion of a combination of courses, become familiar with the history of:
 - The pre-modern world
 - The modern world
 - Transnational or transcultural circulations of ideas, people, and material goods
 - One or more national histories
 - Regional comparisons

Major Qualification Policy and Declaration Process**Major Qualification**

The history major has no qualification. It is advisable to complete at least one lower-division history course (1–99) before declaring, but it is not required. Students who plan on majoring in history are encouraged to declare as soon as possible (see information about declaring below).

Appeal Process**How to Declare a Major**

To declare the history major students should:

1. Create a history major academic plan. For planning documents and major planning instructions visit the declaring the history major webpage.

2. Submit your history major plan and a completed Petition for Major/Minor Declaration to the History Undergraduate Program Coordinator for review and processing.

Transfer Information and Policy**Transfer Admission Screening Policy**

Students planning to apply in this major are not required to complete specific major preparation courses for consideration of admission to UC Santa Cruz.

Transfer students are advised to complete the Intersegmental General Education Transfer Curriculum (IGETC) or UC Santa Cruz general education requirements in preparation for transfer to UC Santa Cruz. Transfer course agreements and articulation between the University of California and California community colleges can be found on the ASSIST.ORG website. Prospective transfer students may also wish to consult the UC Transfer Pathway for History.

Transfer students are enthusiastically encouraged to study history at UC Santa Cruz. Transfer students can finish all of the UC Santa Cruz history major requirements within two years, even if they haven't completed any preparatory history coursework prior to transferring. For additional information for transfer history majors please visit this transfer student information page.

Getting Started at UCSC as a Transfer Student

Transfer students are expected to complete HIS 100 within the first two quarters after transferring to UC Santa Cruz. Transfer students are also encouraged to take KRSG 25 during their first quarter of enrollment at UC Santa Cruz or as part of Summer Transfer Edge before their first quarter.

Letter Grade Policy

History majors may take up to two of their history major courses Pass/No Pass, with the exception of Senior Comprehensive Requirement, provided students are in compliance with the university's Pass/No Pass regulation.

History Senior Check-in

In addition to all coursework, history majors must complete a senior check-in and exit survey in the first quarter of their senior year. Students who do not submit their senior check-in for review may have their graduation date delayed. Please consult the department website for a more detailed description.

Course Substitution Policy

History majors must complete a minimum of five regularly scheduled history courses plus the comprehensive requirement taught by members of the UC Santa Cruz history faculty. Intensive history majors must complete a minimum of eight. Subject to the limits indicated in parentheses, courses from the following categories may also be applied to the history major:

- Courses completed at a California community college or other domestic university (limit of three)
- Education Abroad Program (limit of three)
- UCDC (limit of two)
- UC in Sacramento (limit of two)
- Interdisciplinary Coursework/upper-division courses taken in another UC Santa Cruz department (limit of one)
- Independent and field studies (limit of one)

For information and instructions on how to petition courses from the above categories, visit the History Department webpage on course substitutions.

Double Majors and Major/Minor Combinations Policy

Study Abroad

All history students are encouraged to consider studying abroad. UC Education Abroad Program (EAP) offers students an opportunity to study abroad in more than 40 countries with more than 150 program options. A variety of academic programs are available: language and culture programs facilitate language acquisition; "focus" programs allow students to concentrate on a plan of study applicable to their major. More than half of all EAP programs are in English, and there are traditional semester and yearlong program options. Subject to the limitations described above under "Course Substitution Policy," up to three courses in history completed through EAP may be applied toward major requirements. Consult the History Department website and speak with the undergraduate program coordinator for further details.

Honors

Honors are awarded to the top 10-15 percent of graduating students per quarter; highest honors may be granted to approximately the top five percent. Honors are determined by the Undergraduate Education Committee in consultation with the History Department faculty. The department considers each student's GPA in the history major, supplemented when appropriate by an assessment of work in the senior capstone course or honors thesis preparation. The history major GPA is calculated based upon all history courses attempted at UC Santa Cruz; grades from courses taken outside of the department will not be calculated into a student's history major GPA, even in cases when the student is allowed to use said courses toward their history major degree requirements. Summer, fall, and winter graduates will be reviewed at the end of each of their respective quarters. Spring graduates will be reviewed using their earned history major GPAs as of the spring announcement of candidacy deadline.

Interdisciplinary Coursework

The History Department encourages its majors to take upper-division courses in disciplines related to history, including sociology, literature, community studies, politics, Latin American and Latino studies, and others. Students may petition to substitute one such appropriate upper-division course for a

history elective. At least 50 percent of the readings and written work in these courses must be historical in nature. Consult the History Department website and speak with the undergraduate program coordinator for further details.

These courses are subject to the limitations described above under the "Course Substitution Policy" section.

Regions of Concentration

The History Department curriculum and major is broadly organized along three regions of concentration. Each history major identifies one of three geographic regions of concentration as their primary area of focus:

The Americas and Africa

The Americas and Africa caucus invites students to explore the complex history of intercultural encounter, exchange, and conflict that connects South, Central, and North America and the diverse nations of Africa. Courses in this concentration locate these regions within larger global movements of people, goods, and ideas. Major topical themes in the concentration include Indigenous history, African diaspora, immigration, gender, labor, religion, social movements, politics, and critical history of race. Courses in this concentration extend from the colonial era to the modern day and reflect interdisciplinary approaches to historical practice.

Asia and the Pacific

The Asia and Pacific concentration—which encompasses East, South, and Central Asia along with the Pacific and the Indian Ocean—offers students the opportunity to explore gender, class, race, and ethnicity through the examination of premodern and modern empires and nations, their borders and peripheries, and their flows of people, materials, and ideas. Major topics of focus include the early modern and modern eras, Western and Japanese imperialisms, labor and other major social movements, socialist transformations, and cultural, intellectual, and science history.

Europe and the Mediterranean World

The Europe and the Mediterranean World concentration offers students the opportunity to explore the histories of Europe, North Africa, and the Middle East, and connections between these places and the larger world. We look at the continual flow of ideas, people, and material goods across this region, from the earliest states in the ancient world until today. We examine how empires, colonialism, religion, culture, the environment, and social and economic forces, including the development of capitalism and of the nation-state, shaped these interactions in profound ways. Collectively, we trace more than 5,000 years of intersecting histories, examining linkages and conflicts forged by geography, trade, war, migration, imperial aspirations, colonial violence, religious and ethnic minorities, and struggles for liberation.

The caucus includes intensive study of the histories of Europe, Russia, North Africa and the Middle East, as well as imperial, colonial, and transnational histories that trace the changing relations among these places. Major periods and areas of focus include the ancient and medieval worlds, oceanic empires in the

early modern period (1450-1800 A.D.), modern imperialism and colonialism, and decolonization and postcolonial states in the 20th century.

General History Major

Course Requirements

A minimum of 12 unique courses are required for the major, of which no more than four may be lower-division. At least eight of the 12 courses must be upper-division, including the comprehensive requirement.

Distribution requirements. Among the 12 courses required for the major, at least three must meet chronological distribution requirements. One must be set before 600 C.E., and two must be set in periods prior to the year 1800 C.E.

Students are encouraged to reference the History Course List (p. 146) to determine how history courses may apply to the different geographic regions of concentration and the chronological distribution requirements. Students can also consult the department's website for a sortable version of this information.

Region of Concentration (5 Courses, Plus 1 Comprehensive Requirement)

Each history major identifies one of three geographic regions of concentration as their primary area of focus:

- The Americas and Africa
- Asia and the Pacific
- Europe and the Mediterranean World

Lower-Division Survey (1 Course)

At least one lower-division survey course within their chosen region of concentration. The survey course is one of the four allowed lower-divisions.

Americas/Africa

HIS 10A	United States History to 1877	5
HIS 10B	United States History, 1877 to 1977	5
HIS 11A	Latin America: Colonial Period	5
HIS 11B	Latin America: National Period	5
HIS 30	The Making of Modern Africa	5

Asia/Pacific

HIS 40A	Early Modern East Asia	5
HIS 40B	The Making of Modern East Asia	5
HIS 44	Modern South Asia, 1500 to Present	5

Europe/Mediterranean World

HIS 41	The Making of the Modern Middle East	5
HIS 70A	Modern European History, 1500-1815	5

HIS 70B	Modern European History, 1815-present	5
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Transfer coursework may or may not apply toward the survey course requirement; consult with the history undergraduate program coordinator.

Additional Concentration Courses (4 Courses)

Four additional courses in the region of concentration, at least three of which must be upper-division.

Comprehensive Requirement

One comprehensive requirement: All students must complete either a research seminar (HIS 190 series, HIS 194 series, or HIS 196 series), or a senior thesis (HIS 195A and HIS 195B) in their area of concentration. Detailed information on the comprehensive requirement can be found below.

Breadth Requirements (4 Courses)

Two courses from each of the remaining two regions of concentration.

At least one of the four breadth courses must be upper-division. If two lower-division courses (including the survey) are applied to the region of concentration, then at least two of the four breadth courses must be upper-division.

Historical Skills and Methods (1 Course)

Students who enter UC Santa Cruz as frosh are expected to complete HIS 100 by the end of their second year. Transfer students are expected to complete HIS 100 no later than their second term at UC Santa Cruz. HIS 100 is a prerequisite for all history research seminars (HIS 190 series, HIS 194 series, and HIS 196 series).

HIS 100	Historical Skills and Methods	5
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Elective (1 Course)

One upper-division history course from any of the three regions of concentration.

Language Recommendation

Proficiency in a foreign language is strongly recommended for all history students and is essential for those who plan to pursue graduate studies in history. Many Ph.D. programs in history require applicants to read one or two languages besides English. The University of California Education Abroad Program (EAP) is appropriate for history majors as a means to both enhance language skills and take history courses elsewhere.

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division disciplinary communication (DC) requirement. History students fulfill the upper-division disciplinary communication (DC) requirement by completing a comprehensive requirement in their region of concentration. Students may complete a research seminar (one quarter: HIS 190 series, HIS 194 series, or HIS 196 series) or a thesis (two quarters: courses HIS 195A and HIS 195B). Please consult the department website for a

more detailed description of these courses and refer to the updated DC information in the disciplinary communication chart.

Comprehensive Requirement

History majors may satisfy the UC Santa Cruz comprehensive requirement in one of two ways:

Research Seminar (one quarter: 190 series, 194 series, or 196 series)

In courses designated as History 190, 194, or 196, students participate in a small discussion-based senior research seminar, which provides an opportunity to acquire experience in practical research skills while developing a research project culminating in the writing of a substantial research paper. Students must complete HIS 100 before taking a research seminar. Seminars require submission of written work totaling approximately 25 pages and satisfy the disciplinary communication (DC) general education requirement. Seminars must be taken in the student's chosen area of concentration to qualify as their comprehensive requirement.

Thesis (Two Quarters: HIS 195A, Thesis Research and HIS 195B, Thesis Writing)

Before undertaking an independent thesis, students must complete one research seminar in their region of concentration. In extraordinary circumstances, students may petition the History Department for an exception to this requirement. The successful completion of both HIS 195A and HIS 195B will satisfy the comprehensive and disciplinary communication (DC) requirements for students who are granted an exception to the seminar requirement.

Students who want to write a thesis need to begin planning well in advance. Students must first find a faculty thesis adviser and a second reader to sponsor and advise on the thesis project. Once a thesis adviser and a second reader have been secured and a topic defined, students must submit a thesis proposal to the department for consideration. Proposals are due at least one quarter before the start of the research quarter. Completed theses must be at least 40 pages in length and are due on the last day of the writing quarter.

Please consult the department website for more information about the thesis option.

Research Pathways

The history program encourages its students to carve out their own research pathways. Pathways can be straight or meandering, cover one area exhaustively or take a student across broad stretches. Even though you are required to select one of three geographic regions—the Americas and Africa, Asia and the Pacific, Europe and the Mediterranean World—as your primary area of focus, we encourage you to also think about your degree progress along thematic lines: religion, social movements, science and environment, and gender, to name a few. Faculty and staff advisers will assist students who choose this option with their course selection.

Planners

Each of these planners indicate only one of the many possibly pathways through the major. Individual student plans will vary. For assistance developing your history major plan, meet with the undergraduate program coordinator.

Sample Four Year Plan

	Fall	Winter	Spring
1st (frosh)	Lower-division survey, concentration	Lower-division breadth area No. 1	Lower-division breadth area No. 2
2nd (soph)	Lower-division concentration	HIS 100	Upper-division breadth area No. 1
3rd (junior)	Upper-division concentration	Upper-division breadth area No. 2	Upper-division concentration
4th (senior)	Upper-division concentration	Exit seminar, concentration	Upper-division elective (any)

In addition to the courses above, students will need to take courses that satisfy the Math and Formal Reasoning (MF) and Composition (C) general education requirements, along with any other general education requirements that are not satisfied by the classes they have chosen for the major. Most lower-division history courses satisfy the Cross-Cultural Analysis (CC) or Ethnicity and Race (ER) general education requirements. HIS 100 satisfies the Textual Analysis and Interpretation (TA) general education requirement.

Sample Three Year Plan

This plan is appropriate for students admitted to UC Santa Cruz as freshman who are considering the Three Year Accelerated Pathways program.

	Fall	Winter	Spring
1st Year	Lower-division survey,	Lower-division breadth area	Lower-division breadth area

concentration No. 1 No. 2

Curriculum (IGETC) in preparation for transfer to UC Santa Cruz.

2nd Year Lower-division concentration HIS 100 Upper-division breadth area No. 1
Upper-division concentration Upper-division concentration

Intensive History Major

The intensive major track offers history majors a pathway to enrich their study of history, refine their skills in writing and research, and receive a designation on their transcripts that signals their ambition and accomplishment to potential employers and graduate schools. All history majors are eligible to declare the intensive track, including junior transfers. If a student attempts but does not complete the intensive track, they may still graduate with a standard history degree, provided the appropriate major coursework has been completed.

3rd Year Upper-division concentration Exit seminar, concentration Upper-division breadth area No. 2
Upper-division elective (any)

Course Requirements

A minimum of 15 unique courses are required for the intensive history major, of which no more than four may be lower-division. At least 11 of the 15 courses must be upper-division, including the comprehensive requirement. The intensive major also requires one year or equivalent of language study (see below).

Sample Transfer Plan

	Fall	Winter	Spring
Pre-Transfer	Lower-division survey, concentration	Lower-division breadth area No. 1	Lower-division breadth area No. 2
1st (junior)	HIS 100 Upper-division concentration	Lower-division concentration Upper-division breadth area No. 1	Upper-division concentration Upper-division breadth area No. 2
2nd (senior)	Upper-division concentration	Exit seminar, concentration	Upper-division elective (any)

Distribution requirements. Among the 15 courses required for the intensive major, at least three must meet chronological distribution requirements. One must be set before 600 C.E., and two must be set in periods prior to the year 1800 C.E.

Students are encouraged to reference the History Course List (p. 146) to determine how history courses may apply to the different geographic regions of concentration and the chronological distribution requirements. Students can also consult the department’s website for a sortable version of this information.

Region of Concentration (5 Courses, Plus 1 Comprehensive Requirement)

Each history major identifies one of three geographic regions of concentration as their primary area of focus:

- The Americas and Africa
- Asia and the Pacific
- Europe and the Mediterranean World

Lower-Division Survey (1 Course)

At least one lower-division survey course within their chosen region of concentration. The survey course is one of the four allowed lower-divisions.

Americas Africa

HIS 10A	United States History to 1877	5
HIS 10B	United States History, 1877 to 1977	5
HIS 11A	Latin America: Colonial Period	5
HIS 11B	Latin America: National Period	5
HIS 30	The Making of Modern Africa	5

This planner assumes that a student has completed most of their general education requirements before coming to UC Santa Cruz. Students from California community colleges are advised to complete the Intersegmental General Education Transfer

Asia Pacific

HIS 40A	Early Modern East Asia	5
HIS 40B	The Making of Modern East Asia	5
HIS 44	Modern South Asia, 1500 to Present	5

Europe Mediterranean

HIS 41	The Making of the Modern Middle East	5
HIS 70A	Modern European History, 1500-1815	5
HIS 70B	Modern European History, 1815-present	5

Transfer coursework may or may not apply toward the survey course requirement; consult the history undergraduate program coordinator.

Additional Concentration Courses (4 Courses)

Four additional courses in the region of concentration, at least three of which must be upper-division.

Comprehensive Requirement

One comprehensive requirement: All students must complete either a research seminar (HIS 190 series, HIS 194 series, or HIS 196 series), or a senior thesis (HIS 195A and HIS 195B) in their area of concentration. Detailed information on the comprehensive requirement can be found below.

Breadth Requirements (4 Courses)

Two courses from each of the remaining two regions of concentration.

At least one of the four breadth courses must be upper-division. If two lower-division courses (including the survey) are applied to the region of concentration, then at least two of the four breadth courses must be upper-division.

Historical Skills and Methods (1 Course)

Students who enter UC Santa Cruz as frosh are expected to complete HIS 100 by the end of their second year. Transfer students are expected to complete HIS 100 no later than their second term at UC Santa Cruz. HIS 100 is a prerequisite for all history research seminars (HIS 190 series, HIS 194 series, and HIS 196 series).

HIS 100	Historical Skills and Methods	5
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Electives (4 Courses)

Four upper-division history courses from any of the three regions of concentration.

Advanced Research Requirement

Three of the 15 courses required for the intensive major must require advanced historical research. Advanced research seminars (HIS 190 series, HIS 194 series, or HIS 196 series), the senior thesis (HIS 195A and HIS 195B) and/or independent studies (HIS 199) conducted under faculty supervisor may satisfy this requirement. At least one seminar or senior thesis

must be completed in the student's chosen region of concentration to ensure the UC Santa Cruz comprehensive and disciplinary communication (DC) requirements are satisfied.

Language Requirement

Intensive majors must pursue training in a second language by completing three quarters of college-level language study (or equivalent) in a single, non-English modern or ancient language (e.g. SPAN 1–SPAN 3, ITAL 2–ITAL 4, etc.). Students with prior training in a second language are advised to complete a language placement exam to determine the appropriate level of language course instruction. With prior approval by the undergraduate director, the language training requirement may be satisfied by at least one quarter study abroad with foreign language instruction. Students do not necessarily need to pursue a language related to their region of concentration, but are encouraged to do so when possible. After consultation with the undergraduate director, students can petition for alternative ways by which to satisfy this requirement.

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division disciplinary communication (DC) requirement. History students fulfill the upper-division disciplinary communication (DC) requirement by completing a comprehensive requirement in their region of concentration. Students may complete a research seminar (one quarter: HIS 190 series, HIS 194 series, or HIS 196 series) or a thesis (two quarters: courses HIS 195A and HIS 195B). Please consult the department website for a more detailed description of these courses and refer to the updated DC information in the disciplinary communication chart.

Comprehensive Requirement

History majors may satisfy the UC Santa Cruz comprehensive requirement in one of two ways:

Research Seminar (one quarter: 190 series, 194 series, or 196 series)

In courses designated as History 190, 194, or 196, students participate in a small discussion-based Senior Research Seminar, which provides an opportunity to acquire experience in practical research skills while developing a research project culminating in the writing of a substantial research paper. Students must complete HIS 100 before taking a research seminar. Seminars require submission of written work totaling approximately 25 pages and satisfy the disciplinary communication (DC) general education requirement. Seminars must be taken in the student's chosen area of concentration to qualify as their comprehensive requirement.

Thesis (Two Quarters: HIS 195A, Thesis Research and HIS 195B, Thesis Writing)

Before undertaking an independent thesis students must complete one research seminar in their region of concentration. In extraordinary circumstances, students may petition the History Department for an exception to this requirement. The successful completion of both HIS 195A and HIS 195B will

satisfy the comprehensive and disciplinary communication (DC) requirements for students who are granted an exception to the seminar requirement.

Students who want to write a thesis need to begin planning well in advance. Students must find a faculty thesis adviser and a second reader to sponsor and advise on the thesis project. Once a thesis adviser and a second reader have been secured and a topic defined, students must submit a thesis proposal to the department for consideration. Proposals are due at least one quarter before the start of the research quarter. Completed theses must be at least 40 pages in length and are due on the last day of the writing quarter.

Please consult the department website for more information about the thesis option.

Research Pathways

The history program encourages its students to carve out their own research pathways. Pathways can be straight or meandering, cover one area exhaustively or take a student across broad stretches. Even though you are required to select one of three geographic regions—the Americas and Africa, Asia and the Pacific, Europe and the Mediterranean World—as your primary area of focus, we encourage you to also think about your degree progress along thematic lines: religion, social movements, science and environment, and gender, to name a few. Faculty and staff advisers will assist students who choose this option with their course selection.

Planners

Each of these planners indicates only one of the many possibly pathways through the major. Individual student plans will vary. For assistance developing your history major plan, meet with the undergraduate program coordinator.

Sample Intensive Major Four-Year Plan

	Fall	Winter	Spring
1st (fresh)	Lower-division survey, concentration Language 1	Lower-division breadth area No. 1 Language 2	Lower-division breadth area No. 2 Language 3
2nd (soph)	Lower-division concentration	HIS 100	Upper-division breadth area No. 1
3rd (junior)	Upper-division concentration	Upper-division breadth area No. 2 Upper-division conc	Upper-division concentration

entration

4th (senior)	Exit seminar, concentration	Research course Upper-division elective (any)	Research course Upper-division elective (any)
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In addition to the courses above, students will need to take courses that satisfy the Math and Formal Reasoning (MF) and Composition (C) general education requirements, along with any other general education requirements that are not satisfied by the classes they have chosen for the major. Most lower-division history courses satisfy the Cross-Cultural Analysis (CC) or Ethnicity and Race (ER) general education requirements. HIS 100 satisfies the Textual Analysis and Interpretation (TA) general education requirement.

Sample Intensive Major Transfer Plan

	Fall	Winter	Spring
Pre-Transfer	Lower-division concentration	Lower-division breadth area No. 1	Lower-division breadth area No. 2
1st (junior)	HIS 100 Upper-division concentration	Lower-division concentration Upper-division breadth area No. 1	Upper-division concentration Upper-division breadth area No. 2
2nd (senior)	Language 1 Upper-division concentration	Language 2 Research course	Language 3 Research course
	Exit seminar, concentration	Upper-division elective (any)	Upper-division elective (any)

This planner assumes that a student has completed most of their general education requirements before coming to UC Santa Cruz. Students from California community colleges are advised to complete the Intersegmental General Education Transfer Curriculum (IGETC) in preparation for transfer to UC Santa Cruz.

HISTORY MINOR

Students whose major area of study is not history may nonetheless find that a minor in history makes an invaluable contribution to their studies.

Course Requirements

Eight history courses are required, five of which must be upper-division. There are no distribution requirements, and there is no comprehensive requirement for the minor.

Lower-Division Courses

Three lower-division (HIS 1–HIS 99) and/or upper-division (HIS 100–HIS 199) history courses.

Upper-Division Courses

Five upper-division (HIS 100–HIS 199) history courses.

CLASSICAL STUDIES B.A.

Information and Policies

Introduction

Classical studies at UC Santa Cruz combines features of traditional programs, such as solid grounding in the ancient languages, with innovative, interdisciplinary approaches. While the core of the program is focused on courses in the ancient Greek and Latin languages, the program also encompasses courses in history, the history of art and visual culture, literature, philosophy, politics, and theater arts, from the Bronze Age through the Early Christian era. Recent offerings have included everything from introductory surveys in classical mythology and Greek and Roman history, to advanced courses in women and gender in Ancient Egypt and modern ancient drama. Students are encouraged to study the literary and material artifacts of Greece and Rome within the larger context of ancient Mediterranean and Near Eastern cultures.

The classical studies program provides the nurturing atmosphere and personal attention associated with a small liberal arts college, in the context of a large university. We offer students an opportunity to work in small classes with a distinguished and dedicated teaching faculty and excellent fellow students. Public lectures, guest speakers, and frequent social events bring students and faculty together and strengthen the program.

Classical studies students have the opportunity to give close, sustained attention to an area of study, from an almost unlimited variety of perspectives. For example, students with an interest in contemporary philosophy and political theory might want to concentrate in Greek, taking upper-division courses in Greek, history, philosophy, and politics. Students with an interest in European literature might want to concentrate in Latin, taking upper-division courses in Latin, history, and literature in translation. Students planning on pursuing a classics degree at the Ph.D. level should concentrate most of their coursework in the Greek and Latin languages themselves.

Classical studies is excellent preparation for further study in a wide variety of graduate and professional programs including history, art history, comparative literature, English, philosophy, law, education, and publishing.

Academic Advising for the Program

The Classical Studies program is administered by the Department of History. Students in this program receive advising support from the history undergraduate program coordinator.

Transfer students are encouraged to additionally consult the "Transfer Information and Policy" information included below.

Getting Started in the Major

GREE 1 and LATN 1 are only offered in the fall quarter. Students seeking their degree in four years should complete the introductory sequence in elementary ancient Greek or Latin language no later than their second year. Transfer students should complete the introductory sequence during their first two quarters of enrollment at UC Santa Cruz.

Students with prior knowledge of ancient Greek or Latin are advised to consult with the classical studies faculty to determine if they have satisfied any of the elementary language course requirements.

Program Learning Outcomes

Students who complete the classical studies major graduate with the following knowledge and skills:

Language

- Competence in one or more ancient languages. At present offerings include Greek and Latin (full curriculum offered yearly). Majors have also taken Biblical Hebrew and Hieroglyphics (offered less often).

Interdisciplinary Exposure

- Familiarity with one or more of the disciplinary approaches represented by the faculty in the program, as well as other relevant approaches in the division and the university. Courses at present credited for the major include (but are not limited to) offerings in: history, literature, philosophy, archaeology, art history, and theater arts. For the skills and outcomes fostered by these disciplines see the reports of the relevant departments.

Collaboration

- Provide constructive and effective critiques of each other's work.
- Complete a shared research project.

Research, Critical Reading, Writing

- Gather and engage critically with primary sources.
- Evaluate competing interpretations and multiple narratives.

- Compile a bibliography.
- Present clear and compelling arguments, based on critical analysis of diverse historical sources, and effectively communicate your interpretations in written essays and/or other media.

Scope and Thematics

- Through completion of a combination of courses, become familiar with the ancient cultures of:
 - the western Mediterranean.
 - the eastern Mediterranean.
 - the Near East.
- Comparative study: whether of diverse ancient cultures or of ancient and later cultures
- Reception: ancient culture as understood by later traditions

Major Qualification Policy and Declaration Process

Major Qualification

While classical studies does not have an official qualification policy, it should be noted that the major requires the successful completion of upper-division coursework in ancient Greek and/or Latin language literature. Students who are unable to successfully complete the introductory sequence in elementary ancient Greek or Latin language (or equivalent) will not be able to advance to the upper-division coursework required for this major.

Other Programs That May Be of Interest

Since classical studies is an interdisciplinary field of study, many of the courses in this major are offered by other UC Santa Cruz departments. Students with an interest in the ancient world who would prefer to take courses in English are encouraged to consider the following majors and programs: history, history of art and visual culture, literature, philosophy, and politics.

Appeal Process

How to Declare a Major

Students are permitted to declare the classical studies major at any time but encouraged to do so only after they have successfully completed the lower-division sequence in elementary ancient Greek or Latin language (or equivalent):

1. Fill out a Classical Studies Major Planning Worksheet. Include classical studies courses you've completed, are currently taking, and plan on taking in the future.
2. Meet with the classical studies academic advising coordinator to review and discuss your proposed plan of study. Obtain their signature on your worksheet.
3. Submit your approved Classical Studies Major Planning Worksheet and a completed Petition for Major/Minor

Declaration to the history undergraduate program coordinator for processing.

Transfer Information and Policy

Transfer Admission Screening Policy

Students planning to apply in this major are not required to complete specific major preparation courses for consideration of admission to UC Santa Cruz.

Transfer students from California Community Colleges are encouraged to complete the Intersegmental General Education Transfer Curriculum (IGETC) or UC Santa Cruz general education requirements in preparation for transfer to UC Santa Cruz.

Some background in history and in literary analysis and interpretation is desirable, but not essential. Since this is an interdisciplinary major, preparatory work in art history, history, literature, philosophy, or politics, depending on the student's interests, may also be useful.

Getting Started at UCSC as a Transfer Student

Transfer students entering at the junior level can readily complete the classical studies major within two years, provided that they complete GREE 1 or LATN 1 during their first quarter of enrollment at UC Santa Cruz. These courses are only offered in the fall quarter.

GREE 1	Elementary Ancient Greek	5
LATN 1	Elementary Latin	5

Letter Grade Policy

Students are allowed to complete up to two of their classical studies major or minor requirements for Pass/No Pass.

[Optional Catchall]

Course Substitution Policy

Double Majors and Major/Minor Combinations Policy

Study Abroad

We actively encourage our students to expand their horizons in interdisciplinary and international settings by taking advantage of the University of California Education Abroad Program (EAP). A quarter or year abroad may be seamlessly integrated into any classical studies student's academic plan; up to three of the major or minor elective requirements may be completed abroad.

Honors

All students who announce candidacy during the academic year are reviewed for honors or highest honors in the major. The classical studies faculty advisers determine honors based upon courses applied toward the classical studies major. Performance in courses taken elsewhere and being transferred toward the major will be considered when applicable. The minimum standard applied is excellence in most courses for honors, and excellence in all courses for highest honors. Summer, fall, and winter graduates will be reviewed at the end of each of their

respective quarters. Spring graduates will be reviewed as of the spring announcement of candidacy deadline.

[Optional Catchall]

Requirements and Planners

Course Requirements

The classical studies major requires three lower-division courses (including two elementary language courses), nine upper-division courses, and an additional two-credit upper-division seminar, CLST 197F, which is taken in the same quarter that the senior comprehensive examination is given (see Comprehensive Requirement section below for more information). These must include the following:

Lower-Division Courses

The lower-division sequence in elementary ancient Greek or Latin language (or equivalent):

Either these courses

GREE 1	Elementary Ancient Greek	5
GREE 2	Elementary Ancient Greek	5

or these courses

LATN 1	Elementary Latin	5
LATN 2	Elementary Latin	5

Classical Studies Survey

One lower-division survey of ancient history or literature in translation:

HIS 50	When Pharaohs Reigned: The History of Ancient Egypt	5
HIS 59	The History of the English Language	5
HIS 60	Medical and Scientific Terminology	5
HIS 61	Classical Mythology	5
HIS 62A	Classical World: Greece	5
HIS 62B	Classical World: Rome	5
HAVC 50	Ancient Mediterranean Visual Cultures	5
HAVC 51	Greek Eyes: Visual Culture and Power in the Ancient Greek World	5
HAVC 55	Unclothed: The Naked Body from Antiquity to the Present	5
LIT 61M	Approaches to Classical Myth	5
LIT 61S	Sacred Texts	5
LIT 61X	Tragedy: Learning Through Suffering	5
LIT 80W	Captive Minds: The Literature of Pre-modern Slavery	5
LIT 81A	Homer's Odyssey	5
LIT 81D	The Prophet and the Qur'an	5
THEA 61A	Ancient and Medieval Drama	5

Upper-Division Courses

Three upper-division courses in Greek (LIT 184A-LIT 184Z) and/or Latin literature (LIT 186A-LIT 186Z):

LIT 184A	Introduction to Greek Literature	5
LIT 184B	Greek Drama	5
LIT 184C	Greek Poetry	5
LIT 184D	Prose Authors	5
LIT 184E	Special Topics in Greek Literature	5
LIT 186A	Introduction to Latin Literature	5
LIT 186B	Roman Poetry	5
LIT 186C	Prose Authors	5
LIT 186D	Special Topics in Latin Literature	5

Electives

Six additional classical studies upper-division courses:

CLST 199	Tutorial	5
HIS 159A	Cleopatra to Constantine: Greek and Roman Egypt	5
HIS 159B	Women and Gender in Ancient Egypt	5
HIS 159C	Temple and City: The Egyptian New Kingdom and the City of Thebes	5
HIS 159D	When Cities Were New: the Rise of Urbanism in the Ancient Near East and Mediterranean	5
HIS 160A	Athenian Democracy	5
HIS 160C	Topics in Greek History	5
HIS 161B	Topics in Roman History	5
HIS 163B	Genesis: A History	5
HIS 194S	Special Topics in Ancient Egyptian History	5
HIS 196D	City of Rome	5
HIS 196S	Special Topics in Ancient History	5
HAVC 135F	Art of the Book in Western Europe 500-1600	5
HAVC 151	Greek Myths Antiquity to the Present	5
HAVC 152	Roman Eyes: Visual Culture and Power in the Ancient Roman World	5
HAVC 154	Byzantine Visual Culture: Politics and Religion in the Empire of Constantinople, 330-1453 A. C	5
HAVC 155	Constructing Cleopatra: Power, Sexuality, and Femininity Across the Ages	5
LIT 117A	Old Iranian Literature	5
LIT 118A	Hebrew Bible	5
LIT 125A	Ancient Novel	5
LIT 130A	Ancient Literature in Cross-Cultural Perspective	5

LIT 184A	Introduction to Greek Literature	5
LIT 184B	Greek Drama	5
LIT 184C	Greek Poetry	5
LIT 184D	Prose Authors	5
LIT 184E	Special Topics in Greek Literature	5
LIT 186A	Introduction to Latin Literature	5
LIT 186B	Roman Poetry	5
LIT 186C	Prose Authors	5
LIT 186D	Special Topics in Latin Literature	5
LIT 181A	Biblical Hebrew, Part 1	5
LIT 181B	Biblical Hebrew, Part 2	5
LIT 181D	Reading Egyptian Hieroglyphs, Part 1	5
LIT 181E	Reading Egyptian Hieroglyphs, Part 2	5
LIT 181F	Reading Egyptian Hieroglyphs, Part 3	5
PHIL 100A	Ancient Greek Philosophy	5
PHIL 118	Stoic Ethics	5
POLI 105A	Ancient Political Thought	5

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement in classical studies is satisfied by completing two upper-division courses in Greek literature or Latin literature from the following list:

Greek Literature:

LIT 184B	Greek Drama	5
LIT 184C	Greek Poetry	5
LIT 184D	Prose Authors	5
LIT 184E	Special Topics in Greek Literature	5

Latin Literature:

LIT 186B	Roman Poetry	5
LIT 186C	Prose Authors	5
LIT 186D	Special Topics in Latin Literature	5

Comprehensive Requirement

Classical studies majors are required to pass a senior comprehensive examination. Each student shall identify a minimum of two classical studies faculty members to serve on the examination committee, one of which shall be designated as the committee chair. Please consult the classical studies website for a more detailed description of this requirement.

Enrollment in a 2-credit comprehensive examination preparatory course, CLST 197F, is required in the same quarter that the senior comprehensive examination will be given. The preparatory course will be taken with the chair of the student's examination committee.

CLST 197F	Senior Comprehensive Examination Preparation	2
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Planners

Sample Four-Year Plan

	Fall	Winter	Spring
1st (frosh)	GREE 1 or LATN 1	GREE 2 or LATN 2	LIT 184A or LIT 186A
	CLST lower-division survey		
2nd (soph)	LIT 184-series/LIT 186-series	LIT 184-series/LIT 186-series	Upper-division elective
3rd (junior)	Upper-division elective	Upper-division elective	Upper-division elective
4th (senior)	Upper-division elective	Upper-division elective	CLST 197F (2 credits)

In addition to the specific courses shown above, a student must complete courses satisfying all of UC Santa Cruz's general education requirements. Individual student plans will vary, and some general education requirements may be satisfied within the classical studies major requirements depending on each student's individual course selection.

Sample Transfer Plan

	Fall	Winter	Spring
1st (junior)	GREE 1 or LATN 1	GREE 2 or LATN 2	LIT 184A or LIT 186A
	CLST lower-division survey	Upper-division elective	Upper-division elective
	Upper-division elective		
2nd (senior)	LIT 184-series/LIT 186-series	LIT 184-series/LIT 186-series	Upper-division elective
	Upper-division elective	Upper-division elective	CLST 197F (2 credits)

This planner assumes that a student has completed most of their general education requirements before coming to UC Santa Cruz. Students from California community colleges are advised to complete the Intersegmental General Education Transfer Curriculum (IGETC) in preparation for transfer to UC Santa Cruz.

CLASSICAL STUDIES MINOR

Course Requirements

The classical studies minor requires a minimum of seven courses: two lower-division ancient Greek or Latin language courses (or equivalent), and five upper-division courses (minimum of 25 upper-division credits).

Lower-Division Courses

A minor in classical studies requires the lower-division sequence in elementary Greek or Latin language (or equivalent):

Either these courses

GREE 1 Elementary Ancient Greek 5

GREE 2 Elementary Ancient Greek 5

or these courses

LATN 1 Elementary Latin 5

LATN 2 Elementary Latin 5

Students with prior knowledge of ancient Greek or Latin are advised to consult with the classical studies faculty to determine if they have satisfied any of the elementary language course requirements.

Upper-Division Courses

Choose one of the following courses:

LIT 184A Introduction to Greek Literature 5

LIT 186A Introduction to Latin Literature 5

Reading proficiency in ancient Greek or Latin required for these courses. LIT 184A should be taken after GREE 2, and LIT 186A should be taken after LATN 2.

Plus any four of the upper-division courses listed below

CLST 199 Tutorial 5

HIS 159A Cleopatra to Constantine: 5

Greek and Roman Egypt

HIS 159B Women and Gender in Ancient 5

Egypt

HIS 159C Temple and City: The 5

Egyptian New Kingdom and

the City of Thebes

HIS 159D When Cities Were New: the 5

Rise of Urbanism in the

Ancient Near East and

Mediterranean

HIS 160A Athenian Democracy 5

HIS 160C Topics in Greek History 5

HIS 161B Topics in Roman History 5

HIS 163B Genesis: A History 5

HIS 194S Special Topics in Ancient 5

Egyptian History

HIS 196D City of Rome 5

HIS 196S Special Topics in Ancient 5

History

HAVC 135F Art of the Book in Western 5

Europe 500-1600

HAVC 151 Greek Myths Antiquity to the 5

Present

HAVC 152 Roman Eyes: Visual Culture 5

and Power in the Ancient

Roman World

HAVC 154 Byzantine Visual Culture: 5

Politics and Religion in the

Empire of Constantinople,

330-1453 A. C

HAVC 155 Constructing Cleopatra: 5

Power, Sexuality, and

Femininity Across the Ages

LIT 117A Old Iranian Literature 5

LIT 118A Hebrew Bible 5

LIT 125A Ancient Novel 5

LIT 130A Ancient Literature in Cross- 5

Cultural Perspective

LIT 184A Introduction to Greek 5

Literature

LIT 184B Greek Drama 5

LIT 184C Greek Poetry 5

LIT 184D Prose Authors 5

LIT 184E Special Topics in Greek 5

Literature

LIT 186A Introduction to Latin Literature 5

LIT 186B Roman Poetry 5

LIT 186C Prose Authors 5

LIT 186D Special Topics in Latin 5

Literature

LIT 181A Biblical Hebrew, Part 1 5

LIT 181B Biblical Hebrew, Part 2 5

LIT 181D Reading Egyptian 5

Hieroglyphs, Part 1

LIT 181E Reading Egyptian 5

Hieroglyphs, Part 2

LIT 181F Reading Egyptian 5

Hieroglyphs, Part 3

PHIL 100A Ancient Greek Philosophy 5

PHIL 118 Stoic Ethics 5

POLI 105A Ancient Political Thought 5

EAST ASIAN STUDIES MINOR

East Asian studies addresses the three societies of China, Japan, and Korea in northeast Asia. We recognize that they compose a meaningful regional designation that contains a diverse range of peoples, languages, and cultures. Linked by centuries of common use of the Chinese writing system, a shared textual canon, general principles of statecraft, and the continual circulation of people and goods, the three societies nevertheless also possess distinctive languages, histories, and social

identities, making it necessary to explore each society in its own right.

In recognition of this diversity within the common bonds, East Asian studies at UC Santa Cruz encourages students to explore East Asia in both depth and breadth. Building first upon developing language skills in Chinese or Japanese, students also begin their studies in a historical survey—HIS 40A, HIS 40B, HIS 80C, or HIS 81—which explore the broad regional forces that contextualize each society’s particular trajectory. From these foundations, students are encouraged to investigate a broad range of questions pertinent to each society in classes across the university, including anthropology, economics, education, feminist studies, film and digital media, history, history of art and visual culture, languages, linguistics, literature, music, politics, sociology, and theater arts.

The East Asian studies minor is administered by the Department of History. For additional information on curriculum and advising, visit the East Asian studies website.

STUDY ABROAD

Because the minor is designed to support the integration of language training with exploration of East Asian societies, we strongly endorse participation in one of the many education abroad programs available for UC students in East Asia where language skills acquired at the university are put to practical use in daily life and research. At present, there are UC Education Abroad Programs in China, Japan, Hong Kong, Korea, and Taiwan. Students who complete Chinese or Japanese language courses while studying abroad are expected to complete a language placement exam upon their return to UCSC. Instructions for the placement exam can be found on the Languages and Applied Linguistics website. For more information about study abroad, see the UC Education Abroad Program (UCEAP) and UCSC Study Abroad websites.

Course Requirements

The East Asian studies minor requires a minimum of six courses, five of which must be upper-division (minimum of 25 upper-division credits). Additional lower-division coursework in Chinese or Japanese language may be needed in order to gain the proficiency necessary to take the upper-division Chinese or Japanese language courses required for this minor (see below).

Lower-Division Courses

Language

All East Asian studies minors are expected to gain proficiency in Chinese or Japanese language. Students without prior knowledge of Chinese or Japanese should enroll in beginning Chinese (CHIN 1) or Japanese (JAPN 1) no later than fall quarter of their second year. Students with prior knowledge of Chinese or Japanese are required to complete a language placement exam to determine which course of Chinese or Japanese language instruction best suits their skill level. Instructions for the placement exam may be found on the Languages and Applied Linguistics website. Students may also

pursue study abroad opportunities as a way of acquiring Chinese or Japanese language instruction.

Either these		
courses		
CHIN 1	First-Year Chinese	5
CHIN 2	First-Year Chinese	5
CHIN 3	First-Year Chinese	5
CHIN 4	Second-Year Chinese	5
CHIN 5	Second-Year Chinese	5
CHIN 6	Second-Year Chinese	5
or these		
courses		
CHIN 4H	Accelerated Chinese for Heritage Speakers	5
CHIN 5H	Accelerated Chinese for Heritage Speakers	5
CHIN 6	Second-Year Chinese	5
or these		
courses		
JAPN 1	First-Year Japanese	5
JAPN 2	First-Year Japanese	5
JAPN 3	First-Year Japanese	5
JAPN 4	Second-Year Japanese	5
JAPN 5	Second-Year Japanese	5
JAPN 6	Second-Year Japanese	5

Core Courses

Choose one of the following courses:		
HIS 40A	Early Modern East Asia	5
HIS 40B	The Making of Modern East Asia	5
HIS 80C	Global China	5
HIS 81	Science in the Colonial World	5

Upper-Division Courses

Upper-Division Chinese or Japanese Language

All East Asian studies minors are required to complete two upper-division courses in Chinese language instruction or two upper-division courses in Japanese language instruction. Additional upper-division courses in Chinese or Japanese language may be applied to the upper-division elective requirements (see below).

Chinese Language Courses

CHIN 103	Advanced Chinese: Language and Society	5
CHIN 104	Advanced Chinese: Readings in Literature	5
CHIN 105	Advanced Chinese: Readings in History	5
CHIN 107	Introduction to Classical Chinese Prose	5
CHIN 108	Introduction to Classical Chinese Poetry	5

Japanese Language Courses

JAPN 103	Advanced Japanese	5
JAPN 104	Advanced Japanese	5
JAPN 105	Advanced Japanese	5

JAPN 109	Japanese Language, Culture, and Society	5	HIS 150F	Engendering Empires: Women in Modern Japan and Korea	5
Upper-Division Electives			HIS 194B	Okinawan History	5
Three additional upper-division courses from the East Asian studies curriculum, one of which may be a topically appropriate individual study: CHIN 199, HIS 199, JAPN 199, LIT 199, etc.			HIS 194E	Women in Japanese History	5
ANTH 130C	Politics and Culture in China	5	HIS 194G	China Since the Cultural Revolution: Histories of the Present	5
ANTH 130G	Asian Americans in Ethnography and Film	5	HIS 194H	Gender, Family, and State in China: 1600-Present	5
CHIN 103	Advanced Chinese: Language and Society	5	HIS 194M	Literati, Samurai, and Yangban: Comparative History of State and Elite in East Asia, 1600-1900	5
CHIN 104	Advanced Chinese: Readings in Literature	5	HIS 194U	The Cold War and East Asia	5
CHIN 105	Advanced Chinese: Readings in History	5	HIS 194Y	Memories of WWII in the U.S. and Japan	5
CHIN 107	Introduction to Classical Chinese Prose	5	HIS 194Z	Historical Memory and Historical Narration in China	5
CHIN 108	Introduction to Classical Chinese Poetry	5	JAPN 103	Advanced Japanese	5
CHIN 199	Tutorial	5	JAPN 104	Advanced Japanese	5
ECON 126	Why Economies Succeed or Fail: Lessons from Western and Japanese History	5	JAPN 105	Advanced Japanese	5
ECON 149	The Economies of East and Southeast Asia	5	JAPN 109	Japanese Language, Culture, and Society	5
EDUC 170	East Asian Schooling and Immigration	5	JAPN 199	Tutorial	5
HAVC 122A	Sacred Geography of China	5	LIT 133E	Contemporary Chinese Society, Culture, and Politics	5
HAVC 122B	Constructing Lives in China: Biographies and Portraits	5	LIT 133F	Pacific Rim Discourse	5
HAVC 122C	Writing in China	5	LIT 133G	The Nuclear Pacific	5
HAVC 122D	Chinese Landscape Painting	5	LIT 133H	Haunted by the Forgotten War: Literature and Film of the Korean War	5
HAVC 122F	Bodies in Chinese Culture	5	LIT 133I	Global Japan: Literatures of the Japanese Diaspora	5
HAVC 127A	Buddhist Visual Worlds	5	LIT 141B	Classical Chinese Culture and Literature, 10th Century B.C.E. through Sixth Century C.E.	5
HAVC 127B	Buddhist Pure Lands	5	LIT 141C	Classical Chinese Culture and Literature, Sixth Century through 16th Century	5
HAVC 190D	The World of the Lotus Sutra	5	LIT 149C	The 1960s	5
HAVC 190F	Chan Texts and Images	5	LIT 162B	Literature of the Asian Diaspora	5
HAVC 190G	Buddhist Wisdom Traditions	5	POLI 140D	Politics of East Asia	5
HIS 101D	World History of Science	5	POLI 141	Politics of China	5
HIS 101F	Global Environmental History	5	POLI 161	The Rise of China	5
HIS 106B	Asian and Asian American History, 1941-Present	5	POLI 190T	Governance and Conflict in East Asia	5
HIS 140B	History of Qing China, 1644-1911	5	SOCY 128	Law and Politics in Contemporary Japan and East Asian Societies	5
HIS 140C	Revolutionary China 1895-1960	5	SOCY 128J	The World Jury on Trial	5
HIS 140D	Recent Chinese History	5	THEA 161D	Asian Theater: An Anthropological Approach	5
HIS 140E	Women in China's Long 20th Century	5	JEWISH STUDIES B.A.		
HIS 145	Gender, Colonialism, and Third-World Feminisms	5	Information and Policies		
HIS 150A	Emperors and Outcasts: Ancient Japan	5			
HIS 150B	Tokugawa Japan	5			
HIS 150C	Inventing Modern Japan: The State and the People	5			
HIS 150D	The Japanese Empire, 1868-1945	5			
HIS 150E	History and Memory in the Okinawan Islands	5			

Introduction

The interdisciplinary program in Jewish studies introduces students to the study of classical, medieval, and modern Jewish cultures and to the range of disciplines that bear upon the field.

The Jewish studies major and minor offer students the chance to study Jewish communities and cultures across the world, with special reference (though not limited) to modern issues. The major and minor will help them prepare to move successfully into graduate programs in a variety of disciplines, especially in humanities, social sciences, and pre-professional programs, and will provide students with a grounding in materials fundamental to a liberal arts education. This program connects with a range of disciplines and programs on the UC Santa Cruz campus that explore the meanings of modernity; at the same time, this program will help students develop analytical tools, methodological versatility, and critical literacy.

Note that modernity here is not defined as unfolding solely in Europe or North America; the Jewish studies program intends to speak to modernity as a global phenomenon, dealing with sites where Jews lived. In the 19th and 20th centuries Jews were widely spread across the globe and often played active and influential roles in their communities. These include such places as China, India, Latin America, North Africa, the Middle East, as well as Europe and North America.

Academic Advising for the Program

The Jewish studies program is administered by the Department of History. Students in this program receive advising support from the history undergraduate program coordinator.

Transfer students are encouraged to consult the "Transfer Information and Policy" information included below.

Getting Started in the Major

Program Learning Outcomes

Jewish History and Culture

- Identify and interpret major events, figures, and topics in Jewish history and culture.

Holocaust

- Demonstrate thorough knowledge of the Holocaust as a historical phenomenon.
- Develop a nuanced understanding of the cultural dimensions of the Holocaust through an analysis of literature, films, art, and/or music.

Jewish Languages

- Develop basic competency in Hebrew (modern or Biblical) or Yiddish.

Critical Analysis

- Distinguish between primary and secondary sources.
- Evaluate competing interpretations and multiple narratives of the past.

- Analyze Jewish cultural sources, including literary texts, films, and music within a broader, cross-cultural context.

Effective Communication

- Present clear and compelling arguments, based on critical analysis of diverse literary, historical, film, and/or musical sources, and effectively communicate interpretations in written essays and/or other media.

Scope

- Classical Period.
- Modern Period.

Major Qualification Policy and Declaration Process

Major Qualification

Undeclared students may declare the Jewish studies major at any time. While specific courses are not required in order to declare, students will have ideally completed some or all of the lower-division requirements.

Appeal Process

How to Declare a Major

- Fill out a Jewish Studies Major Planning Worksheet. Include Jewish studies courses you've completed, are currently taking, and plan on taking in the future.
- Meet with a Jewish studies faculty advisor to review and discuss your proposed plan of study. Obtain their signature on your worksheet.
- Submit your approved Jewish Studies Major Planning Worksheet and a completed Petition for Major/Minor Declaration to the history undergraduate program coordinator for processing.

Transfer Information and Policy

Transfer Admission Screening Policy

Students planning to apply in this major are not required to complete specific major preparation courses for consideration of admission to UC Santa Cruz.

Transfer students entering at the junior level can readily finish all of the Jewish Studies major requirements within two years, even if they haven't completed any preparatory coursework prior to transferring. Some background in history and in literary analysis and interpretation is desirable, but not essential. Since this is an interdisciplinary major, preparatory work in art history, philosophy, or politics, depending on the student's interests, may also be useful.

Transfer students are encouraged to complete the Intersegmental General Education Transfer Curriculum (IGETC) or UC Santa Cruz general education requirements in preparation for transfer to UC Santa Cruz.

Getting Started at UCSC as a Transfer Student

Transfer students are advised to complete the lower-division Jewish studies course requirements, including the language requirement, by the end of their first year. The upper-division courses required for this major may be taken simultaneously with the required lower-division courses. Please refer to the sample academic plan provided below.

Transfer students may declare the Jewish studies major during their first quarter of enrollment at UC Santa Cruz.

Letter Grade Policy

Students are allowed to complete up to two of their Jewish studies major or minor requirements for Pass/No Pass, with the exception of their comprehensive requirement.

[Optional Catchall]

Course Substitution Policy

Jewish studies majors must take a minimum of five regularly scheduled Jewish studies courses plus the comprehensive/disciplinary communications (DC) requirement from members of the UC Santa Cruz Jewish studies faculty. Subject to the limits indicated, courses from the following categories may be applied to the Jewish studies major:

- Courses transfer from a California Community College or other domestic university (limit of three)
- Education Abroad Program (limit of three)
- Related courses not currently on the pre-approved Jewish studies course list (limit of two)
- Independent and field studies (limit of one)

Double Majors and Major/Minor Combinations Policy

Study Abroad

The program in Jewish studies encourages students to take advantage of the UC Education Abroad Program (EAP). The University of California has developed educational opportunities abroad in conjunction with the Jerusalem Study Center at The Hebrew University of Jerusalem. Subject to the limitations described in the "Course Substitution Policy" section, up to three courses from EAP may be applied toward the Jewish studies major requirements.

Honors

All students who announce candidacy during the academic year are reviewed for honors or highest honors in the major. The Jewish studies faculty advisors determine honors based upon courses applied toward the Jewish studies major. Performance in courses taken elsewhere and being transferred toward the major will be considered when applicable. The minimum standard applied is excellence in most courses for honors, and excellence in all courses for highest honors. Summer, fall, and winter graduates will be reviewed at the end of each of their respective quarters. Spring graduates will be reviewed as of the spring announcement of candidacy deadline.

[Optional Catchall]

Requirements and Planners

Course Requirements

The Jewish studies major requires a minimum of 11 courses, including the comprehensive requirement, and an additional three language courses (or equivalent).

In consultation with a faculty advisor, students will plan a program of study to fulfill the following distribution of courses:

Lower-Division Courses

Language Requirement

Three quarters of lower-division instruction (or equivalent) in a Jewish language in any combination of the student's choosing:

HEBR 1	First-Year Hebrew	5
HEBR 2	First-Year Hebrew	5
HEBR 3	First-Year Hebrew	5
HEBR 4	Second-Year Hebrew	5
HEBR 80	Introduction to Biblical Hebrew	5
YIDD 1	First-Year Yiddish	5
YIDD 2	First-Year Yiddish	5
YIDD 3	First-Year Yiddish	5

Lower-Division Core Courses

Choose one of the following courses:

HIS 74	Introduction to Jewish History and Cultures	5
HIS 74A	Introduction to Middle Eastern and North African Jewish History: Ancient to Early Modern	5
HIS 74B	Introduction to Middle Eastern and North African Jewish History, 1500-2000	5
LIT 61J	Introduction to Jewish Literature and Culture	5

Plus one of the following courses:

HIS 75	Film and the Holocaust	5
HIS 76	The Holocaust	5

Upper-Division Courses

Four upper-division Jewish studies core courses:

HIS 155	History of Modern Israel	5
HIS 163B	Genesis: A History	5
HIS 172A	German History	5
HIS 172B	German Film, 1919-1945	5
HIS 178E	Modern Jewish Intellectual History	5
HIS 185C	Communism, Nationalism, and Zionism: Comparative Radical Jewish Politics	5
HIS 185I	Latin American Jewish History in the Modern Period	5
HIS 185J	The Modern Jewish Experience	5

HIS 185K	Jewish Life in Eastern Mediterranean Port Cities	5	HIS 184B	Racism and Antiracism in Europe: From 1870 to the Present	5
HIS 185L	Where Civilizations Met-- Jews, Judaism, and the Iberian Peninsula	5	JWST 199	Tutorial	5
HIS 185M	Zionism: An Intellectual History	5	LIT 112I	Kafka in Translation	5
HIS 185O	The Holocaust and the Arab World	5	MUSC 80I	Music of Modern Israel	5
HAVC 135E	Jewish Identity and Visual Representation	5	MUSC 80T	Mizrach: Jewish Music in the Lands of Islam	5
JWST 185N	The Holocaust in a Digital World	5	MUSC 80Y	Music, Anti-Semitism, and the Holocaust	5
LGST 114	Jews, Anti-Semitism, and the American Legal System	5	MUSC 81P	History of Jewish Music	5
LGST 115	Law and the Holocaust	5			
LIT 118A	Hebrew Bible	5			
LIT 164A	Jewish Travel Narratives	5			
LIT 164B	Hebrew Poetry	5			
LIT 164C	Global Jewish Writing	5			
LIT 164D	Jewish Diaspora, Ethnicity, and Urban Life	5			
LIT 164G	Literature and the Holocaust	5			
LIT 164H	Jewish Writers and the European City	5			
LIT 164J	Jewish Writers and the American City	5			
LIT 181A	Biblical Hebrew, Part 1	5			
LIT 181B	Biblical Hebrew, Part 2	5			
PHIL 148	The Holocaust and Philosophy	5			

Electives

Four additional Jewish studies courses of the student's choice, three of which must be upper-division.

The following courses are electives only. Students may satisfy their Jewish studies elective requirements by taking additional language, lower-division core, and upper-division core courses from the Jewish studies curriculum.

HIS 2A	The World to 1500	5
HIS 2B	The World Since 1500	5
HIS 70A	Modern European History, 1500-1815	5
HIS 70B	Modern European History, 1815-present	5
HIS 78	Modern Authoritarianism in Europe and Beyond	5
HIS 167A	The First World War	5
HIS 167B	The Second World War in Europe	5
HIS 172C	History of German Film, 1945 to Present	5
HIS 176	Eastern Europe, 1848-2000	5
HIS 178A	European Intellectual History: The Enlightenment	5
HIS 178B	European Intellectual History: The 19th Century	5
HIS 178C	European Intellectual History, 1870-1970	5

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division disciplinary communication (DC) requirement. The DC requirement in Jewish studies is satisfied by completing an exit seminar or thesis:

Choose an exit seminar

One quarter; choose one of the following courses:

HIS 194L	Exile, Diaspora, and Displacement: Jewish Lives from North Africa to the Middle East	5
HIS 194V	Fascism and Anti-Fascism: The Global Spanish Civil War	5
HIS 196G	Topics in Modern Germany and Europe	5
HIS 196M	Shtetl: Eastern European Jewish Life	5
HIS 196N	Eastern European Jewish Social History	5
LIT 190Y	Topics in Jewish Literature and Culture	5

Or a thesis

Two quarters; all-of-the-following-courses:

JWST 195A	Thesis Research	5
JWST 195B	Thesis Writing	5

Comprehensive Requirement

Students may satisfy the Jewish studies comprehensive exit requirement by completing an approved exit seminar or senior thesis:

Choose an exit seminar

One quarter; choose one of the following courses:

HIS 194L	Exile, Diaspora, and Displacement: Jewish Lives from North Africa to the Middle East	5
HIS 194V	Fascism and Anti-Fascism: The Global Spanish Civil War	5
HIS 196G	Topics in Modern Germany and Europe	5
HIS 196M	Shtetl: Eastern European Jewish Life	5
HIS 196N	Eastern European Jewish Social History	5

LIT 190Y	Topics in Jewish Literature and Culture	5
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Or a thesis

Two quarters; all of the following courses:

JWST 195A	Thesis Research	5
JWST 195B	Thesis Writing	5

Classical Chronological Distribution Requirement

One course from the following:

HEBR 80	Introduction to Biblical Hebrew	5
HIS 74	Introduction to Jewish History and Cultures	5
HIS 74A	Introduction to Middle Eastern and North African Jewish History: Ancient to Early Modern	5
HIS 163B	Genesis: A History	5
LIT 61J	Introduction to Jewish Literature and Culture	5
LIT 118A	Hebrew Bible	5
LIT 181A	Biblical Hebrew, Part 1	5
LIT 181B	Biblical Hebrew, Part 2	5

Planners

Sample Four Year Plan

	Fall	Winter	Spring
1st (frosh)	Language 1 HIS 74 or HIS 74A or HIS 74B or LIT 61J	Language 2	Language 3 HIS 75 or HIS 76
2nd (soph)	Upper-division core course 1	Upper-division core course 2	Upper-division core course 3
3rd (junior)	Upper-division core course 4	Additional core or elective 1 (classical requirement)	Upper-division core or elective 2
4th (senior)	Upper division additional core or elective 3	Upper division additional core or elective 4	Exit seminar or thesis (DC)

In addition to the specific courses shown in these planners, a student must complete courses satisfying all of UC Santa Cruz's general education requirements. Individual student plans will vary, and some general education requirements may be satisfied by Jewish studies major requirements depending on each student's individual course selection.

Sample Transfer Plan

	Fall	Winter	Spring
1st (junior)	Language 1 HIS 74 or HIS 74A or HIS 74B or LIT 61J	Language 2 Upper-division core course	Language 3 HIS 75 or HIS 76
2nd (senior)	Upper-division core course 3	Additional core or elective 1 (classical requirement)	Upper-division core course 2
	Upper-division core course 3	Upper-division core course 4	Upper-division additional core or elective 4
	Upper-division additional core or elective 2	Upper-division additional core or elective 3	Exit seminar or thesis (DC)

This planner assumes that a student has completed most of their general education requirements before coming to UC Santa Cruz. Students from California community colleges are advised to complete the Intersegmental General Education Transfer Curriculum (IGETC) in preparation for transfer to UC Santa Cruz.

These are sample plans. Actual student plans will vary according to annual course offerings and student's unique academic goals. Editable versions of these plans are available on the Jewish Studies website.

JEWISH STUDIES MINOR

Students whose major area of interest is not Jewish studies may nonetheless find that a minor in Jewish studies makes an invaluable contribution to their studies. This introduction to Jewish studies is helpful for students who plan to do graduate work in Jewish studies, whether through traditional academic disciplines or in Jewish studies programs, and also for students who plan to attend rabbinical schools or to find work with Jewish communities. For others with an interest in Jewish

topics, but without such plans, a minor in Jewish studies offers intellectual enrichment and a focus within the student's chosen field.

Course Requirements

The minor requires a minimum of eight courses. A minimum of 5 upper-division courses must be completed within the Jewish studies minor course requirements. In consultation with a faculty adviser, students will plan a program of study to fulfill the following distribution of courses:

Lower-Division Courses

One of the following Jewish studies core courses:

HIS 74	Introduction to Jewish History and Cultures	5
HIS 74A	Introduction to Middle Eastern and North African Jewish History: Ancient to Early Modern	5
HIS 74B	Introduction to Middle Eastern and North African Jewish History, 1500-2000	5
HIS 75	Film and the Holocaust	5
HIS 76	The Holocaust	5
LIT 61J	Introduction to Jewish Literature and Culture	5

Upper-Division Courses

Three upper-division Jewish studies core courses:

HIS 155	History of Modern Israel	5
HIS 163B	Genesis: A History	5
HIS 172A	German History	5
HIS 172B	German Film, 1919-1945	5
HIS 178E	Modern Jewish Intellectual History	5
HIS 185C	Communism, Nationalism, and Zionism: Comparative Radical Jewish Politics	5
HIS 185I	Latin American Jewish History in the Modern Period	5
HIS 185J	The Modern Jewish Experience	5
HIS 185K	Jewish Life in Eastern Mediterranean Port Cities	5
HIS 185L	Where Civilizations Met-- Jews, Judaism, and the Iberian Peninsula	5
HIS 185M	Zionism: An Intellectual History	5
HIS 185O	The Holocaust and the Arab World	5
HAVC 135E	Jewish Identity and Visual Representation	5
JWST 185N	The Holocaust in a Digital World	5
LGST 114	Jews, Anti-Semitism, and the American Legal System	5
LGST 115	Law and the Holocaust	5
LIT 118A	Hebrew Bible	5
LIT 164A	Jewish Travel Narratives	5

LIT 164B	Hebrew Poetry	5
LIT 164C	Global Jewish Writing	5
LIT 164D	Jewish Diaspora, Ethnicity, and Urban Life	5
LIT 164G	Literature and the Holocaust	5
LIT 164H	Jewish Writers and the European City	5
LIT 164J	Jewish Writers and the American City	5
LIT 181A	Biblical Hebrew, Part 1	5
LIT 181B	Biblical Hebrew, Part 2	5
PHIL 148	The Holocaust and Philosophy	5

Electives

Four additional core or elective courses from the Jewish studies curriculum, two of which must be upper-division.

The following courses are electives only. Students may satisfy their Jewish studies elective requirements by taking additional lower-division core and/or upper-division core courses from the Jewish studies curriculum. Jewish studies minors may also apply lower-division Hebrew or Yiddish language courses to their elective requirements.

HIS 2A	The World to 1500	5
HIS 2B	The World Since 1500	5
HIS 70A	Modern European History, 1500-1815	5
HIS 70B	Modern European History, 1815-present	5
HIS 78	Modern Authoritarianism in Europe and Beyond	5
HIS 167A	The First World War	5
HIS 167B	The Second World War in Europe	5
HIS 172C	History of German Film, 1945 to Present	5
HIS 176	Eastern Europe, 1848-2000	5
HIS 178A	European Intellectual History: The Enlightenment	5
HIS 178B	European Intellectual History: The 19th Century	5
HIS 178C	European Intellectual History, 1870-1970	5
HIS 184B	Racism and Antiracism in Europe: From 1870 to the Present	5
JWST 199	Tutorial	5
LIT 112I	Kafka in Translation	5
MUSC 80I	Music of Modern Israel	5
MUSC 80T	Mizrach: Jewish Music in the Lands of Islam	5
MUSC 80Y	Music, Anti-Semitism, and the Holocaust	5
MUSC 81P	History of Jewish Music	5

HISTORY M.A.

Introduction

The Department of History offers an M.A. degree in history for those individuals who are interested in postgraduate work, but

who are not planning to complete a Ph.D. It is a degree program that can fulfill in-service education requirements for current teachers as well as for future teachers earning a single-subject credential in social studies. Part-time enrollment is allowed.

Each student will be required to choose one of three areas of specialization (U.S., Europe, East Asia). To complete the degree, each student must pass a total of 12 courses of 5 credits each and two courses of 2 credits each. Students are required to produce a substantial research essay (average word count of 8000-10,000) grounded in original research in primary historical documents. There is no language requirement.

Detailed information for prospective graduate students, including procedures for applications and admission to graduate studies, examinations and requirements is available from the Division of Graduate Studies.

Applications

The deadline for applications to the History Program is Dec. 10 of each year. Admission information and application material are on the Division of Graduate Studies website.

Requirements

The M.A. degree is awarded after two years in residence, provided that the following requirements have been met:

- Completion of 12 five-credit courses and two 2-credit proseminars
- Removal of all Incomplete notations on record
- Approval of an M.A. essay

Course Requirements

HIS 200	Methods and Theories of History	5
HIS 201	Directed Research Colloquium	5
HIS 202	Practicing World History	5

HIS 200: year 1, fall quarter

HIS 201: year 2, winter quarter

HIS 202: year 1, spring quarter

One research seminar during the first four quarters:

HIS 204A	History of Gender Research Seminar	5
HIS 204C	Colonialism, Nationalism and Race Research Seminar	5
HIS 204E	Transnationalism, Borderlands, and History	5

Three Proseminars of 2 credits each including:

HIS 280A	History Graduate Proseminar: Teaching Pedagogy	2
HIS 280B	History Graduate Proseminar: Research Presentations and Grant Writing	2
HIS 280C	History Graduate Proseminar: Job Market	2

HIS 280A: year 1

HIS 280B: year 1

HIS 280C: year 2

Six area of concentration electives of 5 credits each, two of which may be taken outside the History Department.

Courses taken must be graduate seminars, upper-division undergraduate courses, and independent study courses (maximum of two).

Reading seminars in the area of specialization:

U.S.:

HIS 210A	Readings in U.S. History	5
HIS 210B	Readings in U.S. History	5

Europe:

HIS 251A	Readings in Modern European History: Environment and Technology	5
HIS 251B	Readings in Modern European History: Empire	5

East Asia:

HIS 230A	Readings in Late Imperial China	5
HIS 230B	Engendering China	5
HIS 230C	Readings in 20th-Century China	5
HIS 242	Readings in Modern Japan	5
HIS 243	Transnational Japan	5
HIS 244	Gender and Japanese History	5

Other Requirements

[Optional Catchall]

Applying for Graduation

The final essay (hard copy and pdf copy) must be submitted to the graduate program coordinator by the spring quarter deadline. A completed Application for the Master's Degree must be filed with the graduate coordinator with the submission of your final essay.

Essay Review and Evaluation

The Graduate Committee evaluates the master's essays and makes recommendations to the graduate director on the awarding of the M.A. degree. Applicants are notified of the committee's decision in June.

HISTORY PH.D.

Introduction

The Ph.D. program in history at UC Santa Cruz has a global and transnational orientation, and emphasizes an interdisciplinary and cross-cultural approach to historical studies, encouraging innovative thinking about global historical

processes. Each Ph.D. student completes a course of study and original research related to a primary area of research interest. Every student also acquires expertise in a primary teaching field, defined in terms of geography and period, as well as a second teaching field that is different from the primary field. In consultation with their faculty advisors, students will designate primary fields for research and teaching, defined by their temporal, geographical, and thematic or methodological interests, by the end of their first year in the program.

Detailed information for prospective graduate students, including procedures for applications and admissions to graduate studies, examinations and requirement is available from the Division of Graduate Studies.

Applications

The deadline for applications to the History program in Dec. 10 of each year. Admission information and application material are on the Division of Graduate Studies website.

Advancement to Candidacy

Course Requirements

Until they pass the qualifying examination and are formally advanced to candidacy for the Ph.D. degree, students must be in residence at UC Santa Cruz and are expected to complete a minimum of 10 credits each quarter to maintain normal academic progress. Completion of a minimum of 10 courses of 5 credits each and one proseminar of 2 credits (HIS 280A) is required for advancement to candidacy. Courses taken are graduate seminars, independent study courses, and most upper-division courses.

Course Requirements

HIS 200	Methods and Theories of History	5
HIS 201	Directed Research Colloquium	5
HIS 202	Practicing World History	5

HIS 200: year 1, fall quarter

HIS 201: year 2, winter quarter

HIS 202: year 1

One research seminar during the first four quarters:

HIS 204A	History of Gender Research Seminar	5
HIS 204C	Colonialism, Nationalism and Race Research Seminar	5
HIS 204E	Transnationalism, Borderlands, and History	5

One Proseminar of 2 credits:

HIS 280A	History Graduate Proseminar: Teaching Pedagogy	2
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HIS 280A: year 1

Second teaching field:

Each Ph.D student also prepares a second teaching field different from the primary field. Students are required to take at least two courses in their secondary teaching field.

Electives:

Six elective courses of 5 credits each, two of which may be taken outside the History Department. Courses taken are graduate seminars, independent study courses, and most upper-division courses.

Reading seminars in the area of concentration:

Graduate students will complete extensive coursework, no less than three readings seminars, in their primary field of research and teaching specialization. The primary field must be defined in consultation with faculty advisors and declared by the end of the student's first year in the Ph.D. program. Students will acquire expertise in their primary field through regularly offered courses and tailored independent studies with advisors and other faculty members.

Foreign Language Requirements

Students whose research centers on a primarily English-speaking part of the world must demonstrate reading competency in at least one foreign language prior to taking the qualifying examination. Students working on all other parts of the world must demonstrate a reading competency in at least two foreign languages prior to taking the qualifying exam; competency in one of the languages must be demonstrated by the end of the sixth quarter of enrollment. Usually, competency will be demonstrated by passing a reading examination administered by a member of the history faculty. Students who are native speakers of the language in question or who believe that they have already demonstrated competency through previous coursework or through their performance on a standardized test should petition the graduate director to waive this language requirement.

Pre-Qualifying Requirements

Coursework

Students must successfully complete all required courses.

The M.A. Essay

Students are required to produce a substantial research essay grounded in original research in primary historical documents. A successful essay will reflect a general understanding of the field of inquiry along with a critical grasp of the scholarship that currently defines the field; deep knowledge of the specific subject under investigation; the application of appropriate analytical models; and a well-supported interpretation of the materials explored. This essay could (but need not) be a segment of a larger project; but it must be a complete, self-contained essay in and of itself.

Students enroll in HIS 201, Directed Research Colloquium, the winter quarter of their second year. The final essay (pdf copy)

must be submitted to the graduate program coordinator by the spring quarter deadline.

Qualifying Examination (QE) Dossier Requirements

The QE dossier includes three sections, each of which students will prepare in consultation with their primary academic adviser and with the advice of the examiners. Requirements for the contents of the dossier may vary by geographic and thematic areas of emphasis, and should be discussed with faculty advisors and other History Department faculty members on the QE committee at least one full quarter prior to the oral exam date. The exact contents of the dossier will be determined by the primary advisor and other members of the committee. Complete bibliographies must be appended to each piece of the QE dossier. Dossiers generally include:

1. Three field statement essay(s). The first and longest essay (25-30 pages) should review the state of the scholarship in students' main area of teaching expertise, broadly defined and reflecting primary fields of employment within the discipline. One of the two shorter essays (roughly 15-20 pages each) should survey the historiography on the student's more specific area of research. The other should focus either on interdisciplinary theoretical or methodological literature related to the student's program of study or a second area of geographical or thematic specialization (or both). The field statements should demonstrate students' broad competence in subject matter as well as mastery of the theoretical issues and historiographic debates in their designated research and teaching of expertise.
2. Two annotated syllabi that demonstrate students' preparation to teach undergraduate courses in their primary and secondary teaching fields. The syllabi should be annotated to show how each class session would be prepared: principal sources for lectures, principal questions for discussion, reasons for assigning particular readings, etc.
3. A 15-page dissertation prospectus that includes an evaluative survey of the literature relevant to your proposed research topic, an explicit statement of research questions, a detailed discussion of the archival sources, and a consideration of the theoretical issues to be engaged.

Note: Although no specific section of the dossier focuses upon the coursework completed outside the History Department, it is expected that this work will be incorporated into different sections of the portfolio, particularly the theoretical or methodological literature and the dissertation prospectus.

Qualifying Examination

The qualifying examination (QE) emphasizes field mastery, integration of material from different fields, and focused preparation for dissertation research. The QE is a three-hour meeting during which a student presents and discusses a dossier that has been submitted to the student's committee at least three weeks in advance. The examination is taken by the spring quarter of the third year. Prior to taking the QE, all incomplete notations (I) must be cleared from the student's record. Additionally, the student must be registered the quarter the examination is taken.

A pass or fail will be given after the examination based on the student's knowledge and research preparation as demonstrated by their dossier. In order to pass the QE, students must receive passing marks from each member of the committee.

Immediately following the exam, the QE committee chair will complete the Report on Qualifying Examination form and submit it to the History Department. If a student does not pass the QE the first time, they may retake only those sections not passed. No one will be permitted to take the QE more than twice.

M.A. Degree

The master of arts (M.A.) degree is awarded to all Ph.D. students after two years in residence, successful completion of 12 courses of 5 credits each and the Teaching Pedagogy proseminar (HIS 280A) of 2 credits, demonstrated competency in at least one foreign language (for those whose research centers on a primarily English-speaking part of the world), removal of all Incomplete notations (I) on record, and approval of a M.A. essay (average word count of 8000-10000, excluding footnotes and bibliography) grounded in original research in primary historical documents.

Dissertation

The dissertation represents an extensive, book-length project grounded in research in original historical documents. A successful dissertation will reflect a broad and deep understanding of the field of inquiry, a mastery of the scholarship that currently defines the field, detailed knowledge of the subject of study growing out of dedicated research, and the incorporation of appropriate interpretive models.

Academic Progress

Evaluation of Academic Progress

Each spring, the History Department reviews the academic progress of all continuing students. All first-year students are required to meet with the Graduate Committee to discuss academic goals and progress.

Time to Degree

During your time in the graduate program, you will become familiar with the terms "normative time" or "timely progress." It is important to progress within expected timetables as it affects many aspects of financial support as well as good academic standing. (See the Graduate Division Graduate Student Handbook.

Applying for Graduation

Degree Application

By the end of the first week of the quarter you intend to finish, an Application for Doctor of Philosophy Degree form, which requires dissertation adviser(s) and graduate director signatures, must be filed with the Graduate Division.

Dissertation Completion

The dissertation should be submitted to the dissertation reading committee before the end of the fifth week of the quarter in

which the degree is to be conferred. As a courtesy to the committee, students should provide a hard copy draft unless the committee is willing to accept an electronic copy.

A copy of the **signed** title page along with a PDF of the dissertation must be filed with graduate program coordinator and one copy must be filed online with the Graduate Division by the deadline in the quarter in which the degree is to be conferred (see Academic and Administrative Calendar).

History Course List

Catalog of Course Requirements

The following is a summary list of undergraduate history courses and how they may apply to the different geographic regions of concentration and the chronological distribution requirements. Questions about this list or how to apply courses to the history major should be directed to the [history undergraduate program coordinator](#). The information on this list is subject to change.

Number	Title	Concentrations	Chron. Req.
Lower-Division Courses (1-99)			
HIS 2A	The World to 1500	Americas and Africa, Asia and the Pacific, Europe and the Mediterranean World	Pre-600
HIS 2B	The World Since 1500	Americas and Africa, Asia and the Pacific, Europe and the Mediterranean World	Pre-1800
HIS 4	History of the Present: Investigating the Historical Origins of Contemporary Problems	Americas and Africa, Europe and the Mediterranean World	
HIS 9	Introduction to Native American History	Americas and Africa	
HIS 10A	United States History to 1877	Americas and Africa	Pre-1800

HIS 10B	United States History, 1877 to 1977	Americas and Africa	
HIS 11A	Latin America: Colonial Period	Americas and Africa	Pre-1800
HIS 11B	Latin America: National Period	Americas and Africa	
HIS 12	Introduction to Latino American History	Americas and Africa	
HIS 13	Introduction to American Religious Culture	Americas and Africa	Pre-1800
HIS 15	The United States of America from its Founding through Our Time	Americas and Africa	
HIS 20	U.S. Popular Music Movements	Americas and Africa	
HIS 30	The Making of Modern Africa	Americas and Africa	
HIS 40A	Early Modern East Asia	Asia and the Pacific	Pre-1800
HIS 40B	The Making of Modern East Asia	Asia and the Pacific	
HIS 41	The Making of the Modern Middle East	Europe and the Mediterranean World	
HIS 44	Modern South Asia, 1500 to Present	Asia and the Pacific	
HIS 50	When Pharaohs Reign: The History of Ancient Egypt	Europe and the Mediterranean World	Pre-600

HIS 51	Pyramids of Earth: Religion and Symbol in the Ancient World	Europe and the Mediterranean World	Pre- 600
HIS 58	From Pirates to Refugees: The History of the Modern Mediterranean	Europe and the Mediterranean World	
HIS 59	The History of the English Language (online course)	Europe and the Mediterranean World	Pre- 1800
HIS 60	Medical and Scientific Terminology (online course)	Europe and the Mediterranean World	Pre- 600
HIS 61	Classical Mythology	Europe and the Mediterranean World	Pre- 600
HIS 62A	Classical World: Greece	Europe and the Mediterranean World	Pre- 600
HIS 62B	Classical World: Rome	Europe and the Mediterranean World	Pre- 600
HIS 65A	From the Martyrs to the Vikings: Medieval Europe, 200-1000	Europe and the Mediterranean World	Pre- 600
HIS 70A	Modern European History, 1500-1815	Europe and the Mediterranean World	Pre- 1800
HIS 70B	Modern European History, 1815- Present	Europe and the Mediterranean World	
HIS 74	Introduction to	Europe and the Mediterranean World	

	Jewish History and Cultures		
HIS 74A	Introduction to Middle Eastern and North African Jewish History: Ancient to Early Modern	Europe and the Mediterranean World	Pre-1800
HIS 74B	Introduction to Middle Eastern and North African Jewish History, 1500-2000	Europe and the Mediterranean World	
HIS 75	Film and the Holocaust	Europe and the Mediterranean World	
HIS 76	The Holocaust: A Global Perspective	Europe and the Mediterranean World	
HIS 78	Modern Authoritarianism in Europe and Beyond	Europe and the Mediterranean World	
HIS 80C	Global China (online course)	Asia and the Pacific	
HIS 80X	Civil Rights Movement: Grassroots Change and American Society	Americas and Africa	
HIS 80Y	World War II Memories in the U.S. and Japan	Americas and Africa, Asia and the Pacific	
HIS 81	Science in the Colonial World	Asia and the Pacific, Europe and the Mediterranean World	Pre-1800
HIS 82	Global History of the	Americas and Africa	

California Gold
Rush

Upper-Division Courses (100-189)

HIS 100	Historical Skills and Methods	Required course. Students who enter UCSC as frosh are expected to complete HIS 100 by the end of their second year. Transfer students are expected to complete HIS 100 no later than their second term at UCSC.	
HIS 101C	Oceans in World History	Americas and Africa, Asia and the Pacific, Europe and the Mediterranean World	
HIS 101D	World History of Science (online course)	Asia and the Pacific, Europe and the Mediterranean World	Pre-1800
HIS 101E	The Global 1930s	Americas and Africa, Asia and the Pacific, Europe and the Mediterranean World	
HIS 101F	Global Environmental History (online course)	Asia and the Pacific, Europe and the Mediterranean World	Pre-1800
HIS 104C	Celluloid Natives: American Indian History on Film	Americas and Africa	
HIS 104D	Museums and the Representation of Native American History, Memory, and Culture	Americas and Africa	

HIS 105	Nations and Nationalism	Asia and the Pacific, Europe and the Mediterranean World	
HIS 106A	Vietnam War Memories	Americas and Africa, Asia and the Pacific	
HIS 106B	Asian and Asian American History, 1941-Present	Americas and Africa, Asia and the Pacific	
HIS 109A	Race, Gender, and Power in the Antebellum South	Americas and Africa	
HIS 110A	Colonial America, 1500-1750	Americas and Africa	Pre-1800
HIS 110B	Revolutionary America, 1740-1815	Americas and Africa	Pre-1800
HIS 110D	The Civil War Era	Americas and Africa	
HIS 110E	Rise of the Machines: Technology, Inequality, and the United States, 1877 to 1914	Americas and Africa	
HIS 110F	World War USA: The United States from 1914 through 1945	Americas and Africa	
HIS 110G	Strange Days: The USA and its National Security State, 1945-1991	Americas and Africa	
HIS 110H	Greater Reconstruction: Race,	Americas and Africa	

	Empire, and Citizenship in the Post-Civil War United States		
HIS 112	American Feminist Thought, 1750-1950	Americas and Africa	
HIS 113C	Women and American Religious Culture	Americas and Africa	
HIS 114	Market Revolution in Antebellum U.S.	Americas and Africa	
HIS 116	Slavery Across the Americas	Americas and Africa	Pre- 1800
HIS 116A	Unchained Memory: Slavery and the Politics of the Past	Americas and Africa	
HIS 117	Wired Nation: Broadcasting & Telecommunications in the U.S. from the Telegraph to the Internet	Americas and Africa	
HIS 117A	From the Player Piano to Pandora	Americas and Africa	
HIS 118	The Global Cold War, 1945-1991	Americas and Africa, Asia and the Pacific, Europe and the Mediterranean World	
HIS 118A	Conspiracy Planet: How Conspiracies, Conspiracy Theories, and Conspiracy Scandals Shape	Americas and Africa	

	History		
HIS 120	W.E.B. DuBois	Americas and Africa	
HIS 121A	African American History to 1877	Americas and Africa	Pre-1800
HIS 121B	African American History: 1877 to the Present	Americas and Africa	
HIS 122A	Jazz and United States Cultural History, 1900-1945	Americas and Africa	
HIS 122B	Jazz and United States Cultural History, 1945 to the Present	Americas and Africa	
HIS 123	Immigrants and Immigration in U.S. History	Americas and Africa	
HIS 124	Panama Canal and U.S. Empire	Americas and Africa	
HIS 128	Chicana/Chicano History	Americas and Africa	
HIS 130	History of Modern Cuba	Americas and Africa	
HIS 131	Women in Colonial Latin America	Americas and Africa	Pre-1800
HIS 134A	Colonial Mexico	Americas and Africa	Pre-1800
HIS 134B	History of Mexico, 1850 to Present	Americas and Africa	
HIS 137A	Africa to 1800	Americas and Africa	Pre-1800
HIS 137B	Africa from 1800 to	Americas and Africa	

	the Present		
HIS 137C	African Cinema	Americas and Africa	
HIS 139C	Queer Pasts: A Radical Telling of LGBTQ History in the United States	Americas and Africa	
HIS 140B	History of Qing China, 1644-1911	Asia and the Pacific	Pre-1800
HIS 140C	Revolutionary China, 1895-1960	Asia and the Pacific	
HIS 140D	Recent Chinese History	Asia and the Pacific	
HIS 140E	Women in China's Long 20th Century	Asia and the Pacific	
LIT 141B/ HIS 141A	Classical Chinese Culture and Literature, 10th Century B.C.E. through Sixth Century C.E.	Asia and the Pacific	Pre-600
LIT 141C/ HIS 141B	Classical Chinese Culture and Literature, Sixth Century through 16th Century	Asia and the Pacific	Pre-1800
HIS 143B	History of the Philippines, 1815 to the Present	Asia and the Pacific	
HIS 145	Gender, Colonialism, and Third-World Feminisms	Americas and Africa, Asia and the Pacific	
HIS 146A	Colonial South Asia 1750-1947	Asia and the Pacific	

HIS 147A	History of Premodern India	Asia and the Pacific	Pre-1800
HIS 147B	Political and Social History of Modern South Asia	Asia and the Pacific	
HIS 147C	South Asia in the 20th Century	Asia and the Pacific	
HIS 147D	Intellectual History of South Asia	Asia and the Pacific	
HIS 149	Plants, People, and the Making of Modern Southeast Asia	Asia and the Pacific, Europe and the Mediterranean World	Pre-1800
HIS 150A	Emperors and Outcasts: Ancient Japan	Asia and the Pacific	Pre-600
HIS 150B	Tokugawa Japan	Asia and the Pacific	Pre-1800
HIS 150C	Inventing Modern Japan: The State and the People	Asia and the Pacific	
HIS 150D	The Japanese Empire, 1868-1945	Asia and the Pacific	
HIS 150E	History and Memory in the Okinawan Islands (online course)	Asia and the Pacific	
HIS 150F	Engendering Empires: Women in Modern Japan and Korea	Asia and the Pacific	
HIS 151	History of Science,	Europe and the Mediterranean World	Pre-

	Medicine & Technology from Antiquity to the Enlightenment		1800
HIS 151A	Medicine and the Body in the Colonial World	Americas and Africa, Europe and the Mediterranean World	Pre-1800
HIS 151B	Drugs in World History	Americas and Africa, Europe and the Mediterranean World	Pre-1800
HIS 152	Trade and Travel on the Silk Roads	Asia and the Pacific, Europe and the Mediterranean World	Pre-600
HIS 152B	Islam in Eurasia	Asia and the Pacific, Europe and the Mediterranean World	
HIS 154	Post-Colonial North Africa	Europe and the Mediterranean World	
HIS 155	History of Modern Israel	Europe and the Mediterranean World	
HIS 156	Interrogating Politics in the Post-Colonial Middle East	Europe and the Mediterranean World	
HIS 156A	Art, Culture, and Mass Media in the Arab Middle East	Europe and the Mediterranean World	
HIS 156B	Modern Arab Thought	Europe and the Mediterranean World	
HIS 157	The Ottoman Empire	Europe and the Mediterranean World	Pre-1800
HIS 158A	The Escapes of David George: Biographical	Americas and Africa	Pre-1800

	Research on Slavery and Early America		
HIS 158C/ANTH 179	Slavery in the Atlantic World: Historical and Archaeological Perspectives	Americas and Africa	Pre-1800
HIS 159A	Cleopatra to Constantine: Greek and Roman Egypt	Europe and the Mediterranean World	Pre-600
HIS 159B	Women and Gender in Ancient Egypt	Europe and the Mediterranean World	Pre-600
HIS 159C	Temple and City: The Egyptian New Kingdom and the City of Thebes	Europe and the Mediterranean World	Pre-600
HIS 159D	When Cities Were New: the Rise of Urbanism in the Ancient Near East and Mediterranean	Europe and the Mediterranean World	Pre-600
HIS 160A	Athenian Democracy	Europe and the Mediterranean World	Pre-600
HIS 160C	Topics in Greek History	Europe and the Mediterranean World	Pre-600
HIS 161B	Topics in Roman History	Europe and the Mediterranean World	Pre-600
HIS 163B	Genesis: A History	Europe and the Mediterranean World	Pre-600

HIS 164A	Late-Medieval Italy, c. 1200-1400	Europe and the Mediterranean World	Pre- 1800
HIS 164B	Renaissance Italy, c. 1400-1600	Europe and the Mediterranean World	Pre- 1800
HIS 165A	Medieval History and Architecture	Europe and the Mediterranean World	Pre- 1800
HIS 166	Northern Ireland: Communities In Conflict	Europe and the Mediterranean World	
HIS 167A	The First World War	Europe and the Mediterranean World	
HIS 167B	The Second World War in Europe	Europe and the Mediterranean World	
HIS 169	Dutch and Belgian History, 1500 to Present	Europe and the Mediterranean World	Pre- 1800
HIS 170A	French History: Old Regime and Revolution	Europe and the Mediterranean World	Pre- 1800
HIS 170B	French History: The 19th Century	Europe and the Mediterranean World	
HIS 170C	From the Trenches to the Casbah: France and its Empire in the 20th Century	Europe and the Mediterranean World	
HIS 172A	German History	Europe and the Mediterranean World	
HIS 172B	German Film, 1919 - 1945	Europe and the Mediterranean World	
HIS 172C	History of German Film, 1945 to Present	Europe and the Mediterranean World	
HIS 173B	Imperial Russia,	Europe and the Mediterranean World	

	1696-1917		
HIS 173C	History of the Soviet Union	Europe and the Mediterranean World	
HIS 174	Spies: History and Culture of Espionage	Europe and the Mediterranean World	
HIS 176	Eastern Europe, 1848-2000	Europe and the Mediterranean World	
HIS 177	Smoke, Smallpox, and the Sublime: Thinking about the Environment in the 19th Century	Europe and the Mediterranean World	
HIS 177A	Slaves, Soldiers, and Scientists: History of the Tropics	Americas and Africa, Europe and the Mediterranean World	Pre-1800
HIS 178A	European Intellectual History: The Enlightenment	Europe and the Mediterranean World	Pre-1800
HIS 178B	European Intellectual History: The 19th Century	Europe and the Mediterranean World	
HIS 178C	European Intellectual History, 1870-1970	Europe and the Mediterranean World	
HIS 178E	Modern Jewish Intellectual History	Europe and the Mediterranean World	
HIS 181	Modern Britain and the British Empire	Europe and the Mediterranean World	
ANTH 1100/HIS	Postcolonial Britain and France	Europe and the Mediterranean World	

181A

HIS 181B	Africa and Britain in an Imperial World	Americas and Africa, Europe and the Mediterranean World	
HIS 183A	Nineteenth-Century Italy	Europe and the Mediterranean World	
HIS 183B	Fascism and Resistance in Italy	Europe and the Mediterranean World	
HIS 184B	Racism and Antiracism in Europe: From 1870 to the Present	Europe and the Mediterranean World	
HIS 185C	Communism, Nationalism, & Zionism: Comparative Radical Jewish Politics	Americas and Africa, Europe and the Mediterranean World	
HIS 185I	Latin American Jewish History in the Modern Period	Americas and Africa	
HIS 185J	The Modern Jewish Experience	Europe and the Mediterranean World	
HIS 185K	Jewish Life in Eastern Mediterranean Port Cities	Europe and the Mediterranean World	
HIS 185L	Where Civilizations Met--Jews, Judaism, and the Iberian Peninsula	Europe and the Mediterranean World	Pre-1800
HIS 185M	Zionism: An Intellectual History	Europe and the Mediterranean World	
HIS 185N	The Holocaust in a	Europe and the Mediterranean World	

	Digital World		
HIS 185O	The Holocaust and the Arab World	Europe and the Mediterranean World	
HIS 189	@history: Doing History in a Digital Age	Elective Only	
Comprehensive Research Seminar Courses (190s, 194s, and 196s)			
HIS 190A	Slavery and Race in Latin America	Americas and Africa	Pre-1800
HIS 190B	Race and the Nation in Latin America	Americas and Africa	
HIS 190D	Asian and Latino Immigration Since 1875	Americas and Africa, Asia and the Pacific	
HIS 190E	Topics in Chicana/o History	Americas and Africa	
HIS 190F	Research Seminar in the America	Americas and Africa	
HIS 190H	History of Time	Americas and Africa, Europe and the Mediterranean World	
HIS 190K	Wired Planet: Readings on the Global History of Broadcasting and Telecommunications	Americas and Africa	
HIS 190L	Personal Politics in the New South	Americas and Africa	
HIS 190M	The History of Children and Culture of Childhood in the 19th Century	Americas and Africa	
HIS 190N	Topics in African	Americas and Africa	

	History		
HIS 190O	African American Historiography	Americas and Africa	
HIS 190P	Early American Society and Culture	Americas and Africa	Pre-1800
HIS 190Q	The Novel and History	Americas and Africa	
HIS 190R	Research in the History in American Religions	Americas and Africa	
HIS 190T	Latin America in the Cold War	Americas and Africa	
HIS 190U	Power, Culture, and the Federal Bureau of Investigation	Americas and Africa	
HIS 190W	U.S. Civil War and Reconstruction	Americas and Africa	
HIS 190X	History of the Atlantic World, 1492-1824	Americas and Africa	Pre-1800
HIS 190Y	The Atlantic Slave Trade	Americas and Africa	Pre-1800
HIS 190Z	The Long Civil Rights Movement	Americas and Africa	
HIS 194A	Gender, Class and Sex in Shanghai	Asia and the Pacific	
HIS 194B	Okinawan History	Americas and Africa, Asia and the Pacific	
HIS 194C	Special Topics in Modern Chinese	Asia and the Pacific	

	History		
HIS 194E	Women in Japanese History	Asia and the Pacific	
HIS 194G	China Since the Cultural Revolution: Histories of the Present	Asia and the Pacific	
HIS 194H	Gender, Family & State in China, 1600-Present	Asia and the Pacific	
HIS 194J	The Poor and the Everyday in Modern China	Asia and the Pacific	
HIS 194K	Topics in the History of Southeast Asia	Asia and the Pacific	
HIS 194L	Exile, Diaspora, and Displacement: Jewish Lives from North Africa to the Middle East	Europe and the Mediterranean World	Pre-1800
HIS 194M	Literati, Samurai, and Yangban: Comparative History of State and Elite in East Asia, 1600-1900	Asia and the Pacific	Pre-1800
HIS 194N	Urbanites in the Global South, 18th Century to the Present	Americas and Africa, Asia and the Pacific, Europe and the Mediterranean World	
HIS 194O	South Asia in the Twentieth Century	Asia and the Pacific	

HIS 194P	Urban South Asia	Asia and the Pacific	
HIS 194Q	Making Space in the Colonial and Post-Colonial World	Europe and the Mediterranean World	
HIS 194S	Special Topics in Ancient Egyptian History	Europe and the Mediterranean World	Pre-600
HIS 194T	Worlds of Labor in Asia	Asia and the Pacific	
HIS 194U	The Cold War and East Asia	Asia and the Pacific	
HIS 194V	Fascism & Anti-Fascism: The Global Spanish Civil War	Americas and Africa, Europe and the Mediterranean World	
HIS 194W	Social Movements in the Modern Middle East	Europe and the Mediterranean World	
HIS 194Y	Memories of WWII in the U.S. and Japan	Americas and Africa, Asia and the Pacific	
HIS 194Z	Historical Memory and Historical Narration in China	Asia and the Pacific	
HIS 196C	Modern Italian Culture	Europe and the Mediterranean World	
HIS 196D	City of Rome	Europe and the Mediterranean World	
HIS 196E	Modern Irish History	Europe and the Mediterranean World	
HIS 196F	Topics in European Environmental History	Europe and the Mediterranean World	

HIS 196G	Topics in Modern Germany and Europe	Europe and the Mediterranean World	
HIS 196H	Sex And The City-- The History Of Sexuality In Urban Areas Around The Globe	Americas and Africa, Asia and the Pacific, Europe and the Mediterranean World	
HIS 196I	The French Revolution	Europe and the Mediterranean World	
HIS 196K	Studies in European Intellectual History	Europe and the Mediterranean World	
HIS 196M	Shtetl: Eastern European Jewish Life	Europe and the Mediterranean World	
HIS 196N	Eastern European Jewish Social History	Europe and the Mediterranean World	
HIS 196O	Russian Revolution, 1917-1932	Europe and the Mediterranean World	
HIS 196Q	Europe And The World During The Cold War	Europe and the Mediterranean World	
HIS 196S	Special Topics in Ancient History	Europe and the Mediterranean World	Pre-600
HIS 196V	The Soviet Experience	Europe and the Mediterranean World	
HIS 196W	Brave New World? Scientific & Technological Visions Of Utopia And Dystopia In	Europe and the Mediterranean World	

	Russia/Soviet Union		
HIS 196Y	Saints and Holiness in Medieval Europe	Europe and the Mediterranean World	Pre- 1800
HIS 196Z	Europe From the Margins: Outside Influences on Modern European Thought and Culture	Europe and the Mediterranean World	

History of Consciousness

315 Humanities 1
(831) 459-4324
<https://histcon.ucsc.edu/>

PROGRAMS OFFERED

History of Consciousness Ph.D. (p. 167)

History of Consciousness Designated Emphasis (p. 169)

OTHER PROGRAMS OF INTEREST

Critical Race and Ethnic Studies B.A. (p. 103)

Feminist Studies B.A. (p. 112)

History of consciousness is an interdisciplinary graduate program centered in the humanities, with links to the social sciences and the arts. It is concerned with forms of expression and social action as they are manifested in specific historical, cultural, and political contexts. The program stresses flexibility and originality. Interest is focused on problems rather than disciplines. Although students are prepared to teach in particular fields, the emphasis is on questions that span a number of different approaches.

History of consciousness fosters problem-driven research vital to new forms of knowledge and intelligibility and to meet the challenges of imagining new modes of scholarship for the arts, social sciences, and humanities. The department emphasizes a variety of topics in its seminars and research pursuits. These areas of research include studies at the intersection of race, sexuality, and gender; global capitalism and cultural processes; psychoanalytic and semiotic theories of the image; science and technology studies; theories and histories of religion; social movements; and literary studies and poetics. Seminars are regularly offered in these and other areas of ongoing faculty research.

History of Consciousness facilitates its expansive intellectual and pedagogical mission by maintaining strong cooperative relations with affiliated faculty from other campus programs who offer seminars and participate in advising, qualifying examinations, and dissertation committees. The formal list of affiliated faculty is a non-exhaustive indication of advising possibilities beyond the program's core faculty. Campus research organizations, such as the UCSC Center for Cultural Studies, the Humanities Institute, Critical Race and Ethnic Studies, the Science and Justice Working Group, and the Research Center for the Americas, also provide venues for collaborative work.

GRADUATE PROGRAM

Over more than 50 years of existence, the history of consciousness graduate program has become widely

recognized as a leader of interdisciplinary scholarship. Program graduates are influential scholars at prominent universities, and their dissertations have been published by important trade and academic presses. Graduates currently find academic employment in a wide range of disciplines, including literature, feminist studies, science studies, anthropology, sociology, American studies, cultural studies, ethnic studies, communications, the study of religion, and philosophy. In addition, history of consciousness graduates work as filmmakers, museum researchers, free-lance writers, postdoctoral researchers, and academic administrators.

Since the curriculum concentrates on theoretical and methodological issues and is concerned with the integration of disciplines, candidates for admission are expected to have a relatively clear idea of the project they wish to pursue. Experience of advanced work in one or more fields is preferred, but not required.

Students also have the option of doing advanced work in a traditional discipline and receiving a designated emphasis in that specialization. In such cases, students must satisfy the appropriate department's criteria (see departmental websites for information).

HISTORY OF CONSCIOUSNESS PH.D.

Introduction

Detailed information for prospective graduate students, including procedures for application and admission to graduate studies, examinations, and requirements for the doctor of philosophy degree, is available from the Division of Graduate Studies and on the department website.

Applications

The deadline for applications to the history of consciousness (HISC) program is Dec. 10 of each year. Admissions information and application materials are available online. Applications are invited from students with backgrounds and interests in the humanities, arts, and social sciences and are especially encouraged from individuals with a clear idea of the project they wish to undertake. Strong preference is given to applicants working in areas for which the faculty resources in history of consciousness are appropriate and available. Graduate Record Examination (GRE) scores are optional. A writing sample is required of no more than 10 pages. Admission is for the fall quarter only.

It is important to note that in light of California's elimination of affirmative action as an admissions criterion, the History of Consciousness Department reaffirms its commitment to the principles of affirmative action. These principles mean a commitment to diversity, equal opportunity, and outreach to underrepresented communities. Further, this commitment underlines our understanding that the very fabric and quality of our scholarship depends on the representation and interplay

of diverse experience and perspectives. So defined, affirmative action is reflected in every aspect of the history of consciousness program, including scholarship, teaching, admissions, hiring, and the process of departmental governance.

Advancement to Candidacy

Course Requirements

The common requirements are:

- HISC 203A, Approaches, to be taken in fall quarter of the first year;
- HISC 240, Pedagogy of Teaching/Teaching Assistant Training, to be taken in the fall quarter of the first year;
- HISC 203B, the writing-intensive version of Approaches, to be taken in spring quarter of the first year;
- A minimum of five history of consciousness graduate seminars to be taken during the first two years (HISC 203A and four additional HISC seminar classes, not including HISC 203B);
- HISC 291, a two-credit advising course, to be taken each quarter;

Students register for a minimum of two courses (5 credits each) plus HISC 291 (2 credits) per quarter until after Advancement to Candidacy, at which time they may register for one course per quarter (normally HISC 299A) plus the 2-credit HISC 291 in order to qualify for full-time enrollment. With the exception of HISC 203A, HISC 203B, HISC 240 and the five required history of consciousness seminars, courses taken to fulfill the university enrollment requirements may include not only history of consciousness seminars but also independent study courses with specific faculty and graduate seminars offered in other departments.

HISC 203A	Approaches to History of Consciousness	5
HISC 203B	Approaches to History of Consciousness	5
HISC 240	Basic Principles of University-Level Pedagogy	2
HISC 291	Advising	2

Minimum of five HISC grad seminars

A minimum of five history of consciousness graduate seminars during the first two years (HISC 203A and four additional HISC seminar classes, not including HISC 203B).

Foreign Language Requirements

Students must demonstrate a proficiency in a language other than English (as demonstrated by an undergraduate degree in the language, taking a translation examination, completing coursework, or petitioning for exemption).

Teaching Requirement

Students must complete three quarters of supervised teaching experience.

Pre-Qualifying Requirements

Qualifying Examination

The qualifying examination includes a written and oral component. The written component consists of a qualifying essay (normally drafts of one to two chapters of the proposed dissertation) that demonstrates the candidate's ability to do extended, dissertation-level research, analysis, and writing on an original topic. The written component also includes a dissertation prospectus. The oral examination focuses on the student's qualifying essay, dissertation prospectus, and relevant fields of scholarship.

Post-Qualifying Requirements

Advancement to Candidacy

Students are encouraged to advance to candidacy in their third year. In order to remain within normative time they must advance by the end of their fourth year in the program. In order to advance to candidacy, students must complete their coursework; demonstrate proficiency in a second language (by taking a translation examination, completing coursework, or petitioning for exemption), be in good academic standing, and complete and pass the written and oral portion of the qualifying examination.

[Optional Catchall]

Dissertation

Dissertation

After advancement to candidacy, students concentrate on dissertation writing. The current normative time to degree limit of seven years means that a student usually has a minimum of three years after advancement to candidacy for completion of the dissertation. Students register for one course per quarter (normally HISC 299A) plus the 2-credit HISC 291 which qualifies as full-time enrollment.

Dissertation Defense

A formal dissertation defense is optional. Please consult with the department if you want to pursue this option.

Academic Progress

In order to remain within normative progress, students must advance by the end of their fourth year in the program.

A student who has been advanced to candidacy for more than nine quarters is not considered to be making satisfactory progress.

For a complete list of Academic Requirements and Standards, visit the Graduate Division website.

Applying for Graduation

For information on how to apply for graduation, visit the Graduate Division website.

[Optional Catchall]**HISTORY OF CONSCIOUSNESS
DESIGNATED EMPHASIS****Introduction**

To receive a designated emphasis in history of consciousness, graduate students from other departments must complete the requirements in addition to degree requirements for the doctorate in their home department.

Guidelines and application forms are available in the History of Consciousness Department office.

Requirements**Committee Composition and Departmental Approvals**

The student must have a faculty graduate advisor from core or affiliate faculty in history of consciousness, who serves both on the qualifying examination committee and the dissertation reading committee.

To obtain the designated emphasis in history of consciousness:

1. The request for a designated emphasis must originate in the degree-granting department.
2. Student should complete an application, obtain the history of consciousness advisor's signature and submit with supporting documentation (copies of the QE and Dissertation Committee Nomination forms) to the History of Consciousness Department office.
3. The History of Consciousness Department will notify the student and the home department of approval for the designated emphasis.

Course Requirements

The student must take four graduate courses in history of consciousness. With the approval of the history of consciousness advisor, one of the four required graduate courses may be an independent study.

Writing, Research and/or Teaching Requirements**[Optional Catchall]****Languages and Applied Linguistics**

Department of Languages and Applied Linguistics
218 Cowell College
(831) 459-2054
<https://language.ucsc.edu>

PROGRAMS OFFERED

Applied Linguistics and Multilingualism B.A. (p. 173)

Spanish Studies B.A. (p. 178)

Spanish Studies Minor (p. 183)

**OTHER PROGRAMS OF
INTEREST**

Language Studies B.A. (p. 191)

Linguistics B.A. (p. 185)

Language is an intellectual tool basic to all disciplines. In today's communities, multicultural and global, learning a second language is not a refinement but a necessity—the key to understanding and communicating with others near and far. The goal of the Department of Languages and Applied Linguistics at UC Santa Cruz is to allow students to achieve a substantial level of proficiency in languages other than English. Since such proficiency always includes cultural as well as linguistic comprehension, our courses examine the complex relationship between language and culture.

The Department of Languages and Applied Linguistics offers rigorous training by professional instructors. Most courses are taught in the target language from the very beginning. Currently, we offer courses in Arabic, Chinese, French, German, Hebrew, Italian, Japanese, Persian, Portuguese, Punjabi, Russian, Spanish, Spanish for Heritage speakers, and Yiddish.

Students with previous language preparation who wish to continue in that language take a placement examination to determine the course level appropriate for them. Each language's placement examination format is described in the quarterly Schedule of Classes, along with the date, time, and location of the examination.

Our upper-division courses further expand students' understanding of language in its social contexts, focusing on linguistic, historical, literary, sociological and cultural issues, among others.

Students may also use language courses for the following majors and minors that have a language requirement: classical studies, East Asian studies, global economics, human biology, Italian studies, Jewish studies, Latin American and Latino studies, linguistics, language studies, and literature.

Students of language who are interested in theater have the opportunity to participate in the annual International Playhouse, which presents highly successful programs every spring. To date, pieces have been performed in Chinese, French, German, Hebrew, Italian, Japanese, Latin, Portuguese, Punjabi, Russian, and Spanish.

Study abroad is an important component of language study at UCSC. Language students have various opportunities to study abroad, for a summer, quarter, semester, or year. Students may choose to study abroad through the Division of Global Engagement through the UCSC Summer Abroad Program, or through affiliate programs around the globe. The Division of Global Engagement offers programs in Argentina, Australia, Barbados, Botswana, Brazil, Canada, Chile, China, Costa

Rica, Denmark, Egypt, France, Germany, Ghana, Hong Kong, India, Ireland, Israel, Italy, Japan, Korea, Mexico, Netherlands, New Zealand, Russia, Singapore, South Africa, Spain, Sweden, Taiwan, Tanzania, Thailand, Turkey, United Kingdom, and Vietnam. There are programs available for students of all levels of language ability, including Language and Culture programs for beginner or intermediate speakers, to full immersion programs for students with advanced language skills. For a list of current programs and requirements, please visit the following Global Engagement website.

UNDERGRADUATE PROGRAM

The department houses two vibrant majors, in applied linguistics and multilingualism, and in Spanish studies, as well as a minor in Spanish studies. The applied linguistics and multilingualism major is designed for students who wish to pursue the study of a particular language and, at the same time, gain an in-depth understanding of language use in bilingual and multilingual settings. Applied linguistics courses are taught in English and cover topics such as language and gender, second-language teaching, bilingualism, discourse analysis, and intercultural communication. In Spanish studies, the major and minor are both interdisciplinary programs that promote advanced linguistic proficiency in Spanish studies as well as a broad understanding of the historical and cultural developments of the Spanish-speaking world.

PLACEMENT EXAMS

Information about this topic can be found under the Department of Languages and Applied Linguistics website in the "placement" tab located in the navigation bar at the top of the page.

ACADEMIC ENGLISH

The Department of Languages and Applied Linguistics offers a series of courses in Academic English (ACEN) designed specifically for students whose native language is not English, and who would benefit academically by improving their English language skills. The main objective of these courses is to raise the linguistic, academic, and cultural competence of international students who are currently pursuing various majors at UCSC. ACEN courses help students develop and refine their knowledge of English usage, advanced grammar, vocabulary and idiomatic expressions, while at the same time developing their listening, oral communication, and academic reading and writing skills. The specific content of each course varies per quarter, and thus, none of the courses are prerequisites to the others.

ARABIC

Students interested in acquiring proficiency in Modern Standard Arabic can enroll in language courses from beginning to intermediate levels (ARBC 1 - ARBC 6). The curriculum aims to build a solid foundation in speaking, listening, reading, and writing, as well as

imparting an understanding of culture and society in the modern Arabic-speaking world. Other courses at UC Santa Cruz that may be of interest to students of Arabic are detailed here.

Study Abroad

Students may apply to spend time in Jordan or Morocco, visit the Division of Global Engagement website for information about current programs.

CHINESE

Students interested in acquiring proficiency in Chinese can enroll in language courses from beginning to advanced levels. Only those with no prior experience with the language may enroll in CHIN 1, which is only offered fall quarter. Heritage learners and those with prior instruction are required to take a placement exam. In addition, students may select from among the following programs: a major in applied linguistics and multilingualism, a major in language studies or linguistics, a minor in East Asian studies through the History Department, an individual major in East Asian studies through their college, a major in literature with an emphasis in Chinese literature, or a major in global economics.

The sequence of lower-division courses CHIN 1–CHIN 6 is aimed at enabling students to gain proficiency in aural comprehension, speaking, reading, and writing skills. Instruction takes place mostly in Chinese from the second half of the first quarter. Upper-level courses include CHIN 103, Language and Society; CHIN 104, Readings in Chinese Literature; CHIN 105, Readings in Chinese History; CHIN 107, Introduction to Classical Chinese Prose; and CHIN 108, Introduction to Classical Poetry.

Study Abroad

Students may apply to study intensive Chinese language at universities—in Taipei, Hong Kong, or Beijing—for periods ranging from a summer up to a full year through the Division of Global Engagement. Courses taken abroad can, with approval of an adviser, be applied to major requirements. For a list of current programs and requirements, visit the Division of Global Engagement website. For information on credit applied to a major, please contact the appropriate department.

FRENCH

Students interested in acquiring proficiency in French can enroll in language courses from beginning to advanced levels. In addition, students may select from among the following programs: a major in applied linguistics and multilingualism, a major in language studies, a major in literature with an emphasis in French literature, or a major in global economics.

Lower-division FREN 1–FREN 6 are taught entirely in French and prepare students for advanced study either on

campus or abroad. They are designed to help students develop proficiency in aural comprehension, speaking, reading, and writing skills, and to introduce student to French and Francophone cultures. Upper-division courses, also taught in French, are offered on topics such as French phonetics, advanced grammar and composition, French civilization, French linguistics, history of the French language, French for professions, and French social activism through song.

Study Abroad

The Division of Global Engagement offers both semester and one-year programs in many regions of France, including Bordeaux, Lyon, Grenoble, Toulouse, and Paris. With the approval of an adviser, some French courses taken abroad may be applied to major requirements. For a list of current programs and requirements, visit the Division of Global Engagement website.

GERMAN

Students interested in learning German at UCSC can enroll in language courses from beginning to advanced levels. In addition, students may select from among the following programs: a major in applied linguistics and multilingualism, a major or minor in language studies, a major in literature with an emphasis in German literature, or a major in global economics.

The sequence of lower-division courses GERM 1–GERM 6 is aimed at helping students to develop listening and reading comprehension, as well as speaking, reading, and writing skills. Another sequence of lower-division courses, equivalent to levels 1, 2, and 3, consists of courses GERM 1A and GERM 1B, which offer accelerated German language instruction. GERM 1A and GERM 1B are taught sequentially, winter and spring quarters. The German language sequence also includes a course on German Media (GERM 119) and a third-year course entitled Advanced German Conversation and Composition (GERM 120); successful completion of GERM 5 is a prerequisite for these courses. Instruction takes place in German. After completing German 5 (or testing out of that course), students are also able to take courses in the literature department that are taught almost exclusively in German.

Study Abroad

The Division of Global Engagement offers study abroad opportunities in Berlin and Munich. Students may spend a summer semester or full academic year in Berlin or a summer in Munich. The semester and full-year programs are at the Freie Universität, the Humboldt Universität and the Technische Universität. Both the Freie Universität and the Technische Universität also offer summer programs. The summer program at the Freie Universität is self-designed. Students may choose their own curriculum from a variety of available courses (in English or German). The summer program at the Technische Universität is designed for science and engineering

majors. Students concentrate on a single engineering course (in English), with visits to relevant companies and research facilities in Berlin. The summer program in Munich (in English) is designed for science, engineering, and environmental studies majors and concentrates on sustainability and green technology, with visits to relevant companies and research facilities. Language requirements for admission to these programs range from little or no German required (summer programs in Berlin and Munich and the FU-BEST program in Berlin) to two years of college-level German required (regular course of study in Berlin). Academic and professional internship opportunities are also available to all students on study abroad in programs Germany.

Students may apply to any of these programs at any point in their student career. For the yearlong programs, students generally apply in their sophomore year for a junior year abroad. As an exception, some students apply in their junior year for a senior year abroad; such students must sometimes spend an additional quarter at UC Santa Cruz in order to satisfy all requirements for their major. Courses taken abroad can, with approval of an adviser, be applied to major requirements.

For a list of current programs and requirements, visit the Division of Global Engagement website. For information on credit applied to a major, contact the appropriate department.

HEBREW

Students interested in acquiring proficiency in modern Hebrew can enroll in language courses from beginning to intermediate levels. In addition, credits from these courses may be counted toward the major or minor in Jewish studies. Lower-division courses are aimed at enabling students to gain proficiency in aural comprehension, speaking, reading, and writing. Attention is also given to developing an understanding of the culture, history, and religion that have been expressed through the Hebrew language from antiquity until today. Students interested in learning the basic lexicon and grammatical structures of biblical Hebrew can enroll in HEBR 80. HEBR 1, HEBR 2, and HEBR 3 (or equivalency) are required for the major in Jewish studies, and other Hebrew courses are encouraged. In addition, credits from modern or biblical Hebrew courses may be counted toward the minor in Jewish studies.

ITALIAN

Students interested in acquiring proficiency in Italian can enroll in language courses from beginning to advanced levels. In addition, students may select from among the following programs: a major in applied linguistics and multilingualism, a major or minor in Italian studies, a major or minor in language studies, a major in global economics.

The sequence of lower-division courses ITAL 1–ITAL 6 is aimed at enabling students to gain proficiency in aural comprehension, speaking, reading, and writing. ITAL 1A

and ITAL 1B offer lower-division intensive Italian language instruction equivalent to levels 1, 2, 3. The ITAL 1, ITAL 2, ITAL 3 sequence starts once a year in the fall quarter, while the ITAL 1A-ITAL 1B sequence starts once a year in the winter quarter. Classes are taught in Italian from the beginning level.

Study Abroad

The Division of Global Engagement sponsors programs of study in Italy. For a list of current programs and requirements, visit the Global Engagement website.

JAPANESE

Students interested in acquiring proficiency in Japanese can enroll in language courses from beginning (JAPN 1, JAPN 2, JAPN 3, JAPN 4, JAPN 5, JAPN 6) to advanced levels (JAPN 103, JAPN 104, JAPN 105, JAPN 106). Only those with no prior experience with the language may enroll in JAPN 1, which is only offered fall quarter. Heritage learners and those with prior instruction are required to take a placement exam. See the placement website for more information.

The curriculum aims to build a solid foundation in all four aspects of linguistic skills (speaking, listening, reading, and writing) as well as sociolinguistic competence and cultural knowledge. Instruction takes place mostly in Japanese from the second half of the first quarter.

Students may use Japanese courses for the following majors and minors: a major in applied linguistics and multilingualism, a major in language studies, a major in linguistics, an East Asian minor, a major in global economics, or a major in literature.

See the department's Japanese website for more information about the Japanese program.

Study Abroad

The Division of Global Engagement has information on study in Japan. There are study abroad—programs at many universities, including Doshisha, Hitotsubashi, ICU, Keio, Meiji Gakuin, Osaka, Tsuru, and Waseda. Courses taken abroad can, with approval of an adviser, be applied to major requirements. For a list of current programs and requirements, visit the Division of Global Engagement website. For information on credit applied to a major, contact the appropriate department.

PERSIAN

Students interested in acquiring proficiency in Persian (Farsi) can enroll in beginning language courses (PERS 1–PERS 3), courses available to both heritage and non-heritage speakers. The curriculum aims to build a solid foundation in speaking, listening, reading, and writing, as well as imparting an understanding of Persian culture. Other courses at UC Santa Cruz that may be of

interest to students of Arabic are detailed here:are detailed here.

PORTUGUESE

Students interested in acquiring proficiency in Portuguese may enroll in the first-year Portuguese sequence: PORT 1, PORT 2, and PORT 3. A second-year accelerated Portuguese sequence (PORT 65A–PORT 65B) follows the first-year sequence and is offered over two quarters. The completion of this sequence fulfills the two-year language requirement for study abroad programs. The program is aimed at enabling students to gain proficiency in listening comprehension, speaking, reading, and writing. Instruction takes place in Portuguese from the beginning and draws heavily on Brazilian culture through popular music and cinema.

Study Abroad

Students may apply to spend time either in Rio de Janeiro, Brazil or in Salvador (Bahia) through the Division of Global Engagement. Courses taken abroad can, with approval of an adviser, be applied to major requirements. For a list of current programs and requirements, visit the Division of Global Engagement website. For information on credit applied to a major, contact the appropriate department

PUNJABI

Students interested in acquiring proficiency in Punjabi can enroll in PUNJ 1, PUNJ 2, and PUNJ 3. These courses are intended for both heritage and non-heritage learners and are aimed at enabling students to gain proficiency in aural comprehension, speaking, reading, and writing. Attention is also given to developing an understanding of the culture that has been expressed through the Punjabi language. This program is part of Sikh and Punjabi studies at UCSC. Punjabi language courses are offered every other academic year.

RUSSIAN

The Department of Languages and Applied Linguistics offers beginning level courses in Russian that provide a comprehensive introduction to the language and develop communicative skills (speaking, listening, reading, and writing) within the framework of contemporary Russian culture. RUSS 1 is offered fall quarter; RUSS 2, winter quarter; and RUSS 3, spring quarter.

SPANISH AND SPANISH FOR HERITAGE SPEAKERS

Students interested in acquiring proficiency in Spanish can enroll in a wide range of Spanish language or Spanish for heritage speakers (SPHS) courses, from beginning to advanced levels. The language and culture sequence of lower-division courses (SPAN 1-SPAN 6 as well as SPHS 4–SPHS 6) and upper-division series (SPAN 114,

SPHS 115, SPAN 140, SPAN 141, SPAN 156 and SPAN 150 - SPAN 154 courses) are aimed at enabling students to gain proficiency in aural comprehension, speaking, reading, and writing as well as meta-linguistic and cultural competence. Students are strongly encouraged to finish year-long sequences without interruption and, if possible, to study in Spanish-speaking countries. Students can pursue a major in Spanish Studies or a minor in Spanish. Other programs that require some coursework in Spanish include a major or minor in language studies, a major in literature with an emphasis in Spanish/Latin American/Latino literatures, a major in Latin American and Latino studies, and a major in global economics.

SPANISH

Students interested in taking Spanish classes are required to take the placement examination to enroll in the appropriate level. Students finishing the first year of instruction in Spanish (SPAN 1–SPAN 2–SPAN 3) are encouraged to continue on to second-year (intermediate-level) by taking SPAN 4, SPAN 5, and SPAN 6.

Declared human biology majors have priority enrollment in SPAN 5M, Medical Spanish, but others may enroll if there is space availability. Students are also encouraged to continue with the third-year SPAN 114, SPHS 115, SPAN 140, SPAN 141, and the SPAN 156 and SPAN 150-SPAN 154 series in which a wide variety of topics are covered. For more information on the courses offered in Spanish, please see the course descriptions.

SPANISH FOR HERITAGE SPEAKERS

SPHS has been developed for heritage speakers who, although raised in Spanish-speaking communities or households, are not yet fully proficient in Spanish. SPHS courses take into account the experiences and influences of bilingual and bicultural upbringing.

SPHS students are encouraged to attend a group tutoring session once a week in addition to the regular class meetings. Some lower-division and all upper-division courses can fulfill requirements for several majors or departments, such as education, global economics, language studies, and Latin American and Latino studies.

Heritage speakers who are planning to continue with the Spanish studies major are strongly encouraged to take the SPHS 4–SPHS 5–SPHS 6 sequence of courses. Keep in mind that this is a sequence which starts in the fall.

Study Abroad

The Division of Global Engagement offers programs ranging one quarter or one academic year in Buenos Aires; Argentina, Santiago, Chile; San Jose and Monteverde, Costa Rica; Morelia and Monterrey, Mexico, and Cordoba, Madrid, Alcalá, Barcelona, and Granada, Spain. Generally, students must have completed SPAN 6 or SPHS 6 by the end of the sophomore year to

qualify for a junior year abroad. Courses taken abroad can, with approval of an adviser, be applied to major requirements. For more information, see the Division of Global Engagement website. For information on credit applied to a particular major, contact the appropriate department.

YIDDISH

Students interested in acquiring proficiency in Yiddish can enroll in beginning language courses. In addition, some credit from these courses may be counted toward the major or minor in Jewish studies; consult with the Jewish studies program. Lower-division courses are aimed at enabling students to gain proficiency in aural comprehension, speaking, reading, and writing. Attention is also given to developing an understanding of the culture that has been expressed through the Yiddish language.

APPLIED LINGUISTICS AND MULTILINGUALISM B.A.

Information and Policies

Introduction

Applied linguistics is an interdisciplinary field that seeks to understand how languages are learned (first and second language acquisition), how more than one language is represented and accessed in the mind of the individual (bilingualism), the ways in which language and society intersect (sociolinguistics), how people from different cultural and linguistic backgrounds interact (intercultural communication), and methods and principles of language teaching (pedagogy).

The major in Applied Linguistics and Multilingualism is designed for students who wish to pursue the study of a particular language (e.g., Chinese, French, German, Italian, Japanese, or Spanish), and at the same time, gain an in-depth understanding of language use in bilingual and multilingual settings. Coursework for the major presupposes some familiarity with theoretical linguistics, and thus majors are required to take three foundational courses offered in the Linguistics Department (LING 50; LING 101; LING 111 or LING 112) in addition to APLX 80, the introductory course to applied linguistics. Since applied linguistics is integrally connected to other disciplines such as cognitive and developmental psychology, education, anthropology, and sociology, students have the option of taking some elective courses in these areas. Finally, majors are encouraged to pursue the study of more than one language in order to reflect on and enhance their understanding of the process of second language acquisition.

Academic Advising for the Program

218 Cowell College
831-459-2054
languages@ucsc.edu

The earlier you declare your major in your academic career the better you will be able to plan your courses and the fulfillment of the requirements. If you declare your major early, you will receive more guidance, useful advice and close follow-up.

The Department of Languages and Applied Linguistics provides extensive orientation for the undergraduate major in Applied Linguistics and Multilingualism. It is very important you plan the prerequisite and requisite courses in the appropriate sequence so as to complete your studies in the expected time.

Orientation is provided in two ways: large-group informational session at the beginning of fall quarter, and small-group or individual meetings with a faculty and/or staff advisor throughout the academic year.

Transfer students: Please also consult the Transfer Information and Policy section.

Getting Started in the Major

Program Learning Outcomes

Graduates from the applied linguistics and multilingualism studies bachelor of arts program should:

- **Demonstrate proficiency in a second language.** Students who successfully complete the applied linguistics and multilingualism major will reach an Intermediate-high level of proficiency in their second language (L2) as described in the scale of the American Council of Teachers of Foreign Languages (ACTFL). This is similar to the B2 level on the Common European Framework of Reference. Speakers who complete additional course work through study abroad (an aspect of the major that is very much encouraged) may reach the advanced level in their L2.
- **Be able to analyze critically the contexts and processes of (second and other) language acquisition.** Students will develop an in-depth understanding of processes of and issues relating to the acquisition of more than one language, bilingualism and multilingualism, including social, psycholinguistic and metalinguistic aspects of these processes.
- **Be able to analyze critically the contexts and uses of language in society.** Students will gain an in-depth understanding of social aspects of bilingualism and multilingualism, and issues of language in social contexts. Students will also develop an understanding of how different disciplines work together to make sense of human communication in multilingual contexts.
- **Demonstrate research skills appropriate for the field of applied linguistics, such as collecting and analyzing data.** Students will develop the receptive and productive skills necessary for becoming members of this community of practice. Specifically, they will develop the disciplinary

skills to summarize, interpret and critique both quantitative and qualitative research studies in applied linguistics. Through this process, students will develop the ability to engage in independent reading of scientific texts and research articles, to design basic research projects as well as to collect, analyze, and write about applied linguistic data.

- **Demonstrate effective written and oral communication appropriate for the discipline of applied linguistics.** Students will learn how to review and report on relevant applied linguistic research critically, using discipline-appropriate conventions in written and oral presentations (i.e., expected content, organization, register, and language).

Major Qualification Policy and Declaration Process

Major Qualification

To declare the major, students must have completed Level 4 of a non-English language (e.g., ARBC 4, CHIN 4, FREN 4, ITAL 4, JAPN 4, PORT 65A, SPAN 4, SPHS 4) with a grade of B- or better, or place into Level 5 or higher via placement exam.

If your native language is other than English, please consult with the faculty director to discuss alternative options for meeting this requirement.

Transfer students: Please also consult the Transfer Information and Policy section.

ARBC 4	Second-Year Arabic	5
CHIN 4	Second-Year Chinese	5
FREN 4	Second-Year French	5
GERM 4	Second-Year German	5
ITAL 4	Second-Year Italian	5
JAPN 4	Second-Year Japanese	5
PORT 65A	Accelerated Intermediate Portuguese	5
SPAN 4	Second-Year Spanish	5
SPHS 4	Spanish for Heritage Speakers	5

Appeal Process

Students notified that they are not eligible to declare the major may appeal this decision by submitting a letter to the department chair within 15 working days from the date of notification. Within 15 working days of receipt of the student's appeal, the department will notify the student and their college of its decision regarding the appeal.

How to Declare a Major

Students should submit a petition to declare as soon as they complete the major qualification (MQ) requirements or reach their declaration deadline quarter (whichever comes first).

Students petitioning when the campus declaration deadline is imminent (i.e. in their sixth quarter, for

students admitted as frosh), will either be approved, denied, or provided with conditions (e.g. completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed major qualification (MQ) courses.

Students must meet major qualification requirements prior to declaring the major.

To declare the major, students must first meet with the faculty advisor and then with the academic advisor. Please contact languages@ucsc.edu for further information.

Transfer Information and Policy

Transfer Admission Screening Policy

Students planning to apply in this major are not required to complete specific major preparation courses for consideration of admission to UC Santa Cruz.

Transfer students are strongly advised to complete courses that will satisfy the campus general education requirements or the Intersegmental General Education Transfer Curriculum (IGETC). In addition, transfer students are strongly advised to complete two years of language study in accredited two and four year institutions. While two years of prior language study is strongly is strongly advised, transfer students should be able to complete the applied linguistics and multilingualism major in normative time as long as they place into language Level 4 (Level 5 for students entering UC Santa Cruz in the winter term) upon arrival at UC Santa Cruz.

Getting Started at UCSC as a Transfer Student

Transfer students may declare at any time after completing Level 4 of a non-English language with a grade of B- or better, following the process in "How to Declare a Major." Transfer students who place into Level 5 or higher of their language when they enter UC Santa Cruz can declare the major immediately.

Transfer students should consult an academic advisor at languages@ucsc.edu as soon as possible to learn about language placement tests and other information about the major.

Letter Grade Policy

A maximum of two courses that are used to satisfy the major requirements may be taken for a Pass/No Pass. Please note that the Level 4 course in the student's chosen language and APLX 190 must be taken for a letter grade.

[Optional Catchall]

Course Substitution Policy

Double Majors and Major/Minor Combinations

Policy

Study Abroad

The Division of Global Engagement sponsors programs of study. Students who wish to major in applied linguistics and multilingualism are strongly encouraged to study abroad. For a list of current programs and requirements, visit Global Engagement.

Students who participate in study abroad may petition to apply up to three courses (up to 15 upper-division credits) toward the major.

Honors

Students who wish to be considered for honors should meet the deadline posted by the Office of the Registrar for declaring the intent to graduate. Determination of honors is based on the student's grades for all courses relevant to the major and other factors relevant to an assessment of academic excellence, such as research papers of professional quality. Generally, honors in the major are awarded only to students with a GPA of 3.75 or higher in relevant coursework. Only those students whose performance in coursework is excellent will qualify. Highest honors are awarded only to students whose performance in relevant coursework is outstanding (GPA of 3.90 and above) and who have completed an outstanding original research paper.

[Optional Catchall]

Requirements and Planners

Course Requirements

There are a total of 65 credits (50 upper-division and 15 lower-division) required for the applied linguistics and multilingualism major. See below for a breakdown of the credit requirements.

Lower-Division Courses

All of the following courses:

APLX 80	Introduction to Applied Linguistics	5
LING 50	Introduction to Linguistics	5

Language Study: Completion of Level 6 is Required

ARBC 6	Second-Year Arabic	5
CHIN 6	Second-Year Chinese	5
FREN 6	Second-Year French	5
GERM 6	Second-Year German	5
ITAL 6	Second-Year Italian	5
JAPN 6	Second-Year Japanese	5
PORT 65B	Accelerated Intermediate Portuguese	5
SPAN 6	Second-Year Spanish	5
SPHS 6	Spanish for Heritage Speakers	5

These courses have Level 1 to Level 5 language prerequisites that have to be completed or placed out of.

Upper-Division Courses**Foundation Courses****Take the following course:**

APLX 101	Second-Language Acquisition	5
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and one of the following courses:

LING 100	Phonetics I	5
LING 101	Phonology I	5

and one of the following courses:

LING 111	Syntactic Structures	5
LING 112	Syntax I	5

Advanced Language Proficiency Courses

(10 credits total)

Students must take a minimum of two upper-division, 5-credit courses in the student's target language (Arabic, Chinese, French, German, Italian, Japanese, Portuguese, or Spanish). The complete Advanced Language Proficiency course list is posted on the department's web page. Courses used to fulfill the advanced language proficiency requirement cannot be counted toward the APLX electives. Students may petition to have other 5-credit, upper-division courses offered in the student's target language count toward the advanced language proficiency requirement.

Although languages and applied linguistics does not currently offer upper-division coursework in Arabic or Portuguese, students who have completed the two-year sequence in this language (or demonstrate equivalent proficiency) have the option to, and are welcome to, complete approved upper-division coursework in Arabic or Portuguese through the Division of Global Engagement in order to satisfy the upper-division language requirement for the major in applied linguistics and multilingualism. The department wants to accommodate students having studied Arabic or Portuguese, and satisfaction of the upper-division courses via study abroad is one option to do so. However, participation in study abroad is not a requirement: If students are unable to participate in study abroad for any reason, they are able to choose to fulfill the upper-division language requirement in the Applied Linguistics and Multilingualism major by studying a language that the Languages and Applied Linguistics Department offers at the upper-division level.

CHIN 103	Advanced Chinese: Language and Society	5
CHIN 104	Advanced Chinese: Readings in Literature	5
CHIN 105	Advanced Chinese: Readings in History	5
CHIN 107	Introduction to Classical Chinese Prose	5
CHIN 108	Introduction to Classical Chinese Poetry	5
FREN 108	French Cinema	5
FREN 111	Stylistics	5

FREN 114	French Phonetics	5
FREN 120	French Linguistics	5
FREN 121	History of the French Language	5
FREN 125A	French Civilization: 19th Century	5
FREN 125B	French Civilization: 20th Century	5
FREN 130	French for Professions	5
FREN 136	La Francophonie	5
FREN 131	Social Activism in France: The Tradition of Chanson Française Engagée	5
GERM 119	German Media	5
GERM 120	Advanced German Conversation and Composition	5
ITAL 100	Advanced Italian Composition and Conversation	5
JAPN 103	Advanced Japanese	5
JAPN 104	Advanced Japanese	5
JAPN 105	Advanced Japanese	5
JAPN 109	Japanese Language, Culture, and Society	5
LALS 171	Brazil in Black and White	5
SPAN 114	Advanced Conversation and Composition	5
SPAN 140	Sounds of Spanish	5
SPAN 141	Advanced Spanish Grammar	5
SPAN 150	Topics in Hispanic Linguistics: Introduction to Hispanic Linguistics	5
SPAN 151	Topics in Hispanic Linguistics: Varieties of Spanish	5
SPAN 152	Topics in Hispanic Linguistics: Spanish in the U.S.	5
SPAN 153	Topics in Hispanic Linguistics: Spanish as a Second Language	5
SPAN 154	Topics in Hispanic Linguistics: Spanish Pragmatics	5
SPAN 156A	The Language of Latin America Cinema	5
SPAN 156E	Spanish Culture	5
SPAN 156F	El Humor en Espanol	5
SPAN 156J	Contemporary Central America	5
SPAN 156K	Spanish Discourse Analysis	5
SPHS 115	El ensayo lectura, analisis y redaccion	5

Electives

(20 credits total)

Four upper-division (5-credit) electives from the following list are required, at least three of which must be

APLX courses. Additional courses can be considered, pending approval by the APLX faculty director. Courses used to fulfill the advanced language proficiency requirement cannot be counted toward the APLX electives.

ANTH 139	Language and Culture	5
ANTH 143	Performance and Power	5
APLX 102	Bilingualism	5
APLX 103	Second Language Speech	5
APLX 112	Language and Gender	5
APLX 113	Inter-Cultural Communication	5
APLX 116	Discourse Analysis: Language Use and Context	5
APLX 115	Language and Power	5
APLX 122	Linguistic Diversity & Social Justice	5
APLX 124	Second Language Variation and Sociolinguistics	5
APLX 135	Second Language Teaching	5
APLX 136	Second Language Assessment	5
APLX 138	English Grammar for TESOL	5
EDUC 141	Bilingualism and Schooling	5
FREN 111	Stylistics	5
FREN 114	French Phonetics	5
FREN 120	French Linguistics	5
LING 117	Pragmatics	5
LING 154	Language and Social Identity	5
LING 155	Language and Cognition	5
LING 157	Psycholinguistics and Linguistic Theory	5
LING 181	Structure of Romance Languages	5
LING 183	Structure of French	5
LIT 101	Theory and Interpretation	5
LIT 102	Translation Theory	5
SOCY 142	Language and Social Interaction	5
SPAN 140	Sounds of Spanish	5
SPAN 156K	Spanish Discourse Analysis	5
SPAN 150	Topics in Hispanic Linguistics: Introduction to Hispanic Linguistics	5
SPAN 151	Topics in Hispanic Linguistics: Varieties of Spanish	5
SPAN 152	Topics in Hispanic Linguistics: Spanish in the U.S.	5
SPAN 153	Topics in Hispanic Linguistics: Spanish as a Second Language	5
SPAN 154	Topics in Hispanic Linguistics: Spanish Pragmatics	5

Disciplinary Communication (DC) Requirement

The Disciplinary Communication requirement (DC) is satisfied by successfully completing:

APLX 190	Research Seminar in Applied Linguistics	5
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Comprehensive Requirement

(5 credits total)

In their senior year, applied linguistics and multilingualism majors must satisfy the senior exit requirement with:

APLX 190	Research Seminar in Applied Linguistics	5
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Planners

Four-Year Planner

Year	Fall	Winter	Spring
1st (fresh)	Language 1	Language 2	Language 3
2nd (soph)	Language 4	Language 5	Language 6
3rd (junior)	APLX 80 LING 50	APLX 101 LING 100 or 101	LING 111 or LING 112 APLX elective
4th (senior)	Adv Language course APLX elective	Adv Language course APLX elective	APLX 190 Non-APLX elective

In addition to the specific courses shown in the planner, students must complete the ER, SR, IM, TA, PE, and PR general education requirements. Some electives may satisfy some of these requirements.

Transfer Planner

Year	Fall	Winter	Spring
1st (junior)	APLX 80 LING 50	APLX 101 LING 100	LING 111 or LING 112 APLX

		or 101	elective
	Language 4	Language 5	Language 6
2nd (senior)	Adv Language course	Adv Language course	APLX 190
	APLX elective	APLX elective	Non- APLX elective

This planner assumes that a student has completed most general education requirements before coming to UC Santa Cruz, and places into Level 4 or higher of the language they are studying when they enter UC Santa Cruz.

SPANISH STUDIES B.A.

Information and Policies

Introduction

The interdisciplinary major in Spanish studies is designed to offer students advanced linguistic proficiency in Spanish as well as a broad understanding of the historical and cultural developments of the Spanish-speaking world.

The Spanish studies major at UC Santa Cruz combines the strengths of language and applied linguistics with those of literary and cultural studies. The sequence of courses first exposes students to the academic registers of Spanish, a critical component for both heritage speakers and second language learners. Students then develop academic literacy in the language while gaining familiarity with the methods of analysis in different fields. The configuration of the major affords students flexibility in following their particular interests by choosing one of two tracks: (1) literature and culture or (2) language and linguistics.

These pathways within the major prepare students for a range of career possibilities that involve working with the Spanish-speaking public in a variety of professions (e.g., law, business, public service). Students may also pursue further training in teaching Spanish as a second language at the high school or university level.

Academic Advising for the Program

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831-459-2054
languages@ucsc.edu

The earlier you declare your major in your academic career, the better you will be able to plan your courses and the fulfillment of the requirements. If you declare your major early, you will receive more guidance, useful advice and close follow-up.

The Department of Languages and Applied Linguistics provides extensive orientation for the undergraduate major in Spanish studies. It is very important you plan the prerequisite and requisite courses in the appropriate sequence so as to complete your studies in the expected time.

Orientation is provided in two ways: quarterly large-group informational sessions, and small group or individual meetings with a faculty and/or staff advisor.

Transfer students: Please also consult the Transfer Information and Policy section.

Getting Started in the Major

Program Learning Outcomes

Graduates from the Spanish studies B.A. program should be able to demonstrate:

- **Advanced-level oral proficiency in Spanish.** Students will have the ability to use all the major timeframes (past, present, and future) in their speech and will be able to produce connected discourse of paragraph length. They will be able to satisfy the demands of work and/or school situations in Spanish with both accuracy and fluency.
- **Academic language and literacy skills in Spanish.** Students will be able to read and understand a wide range of authentic texts (e.g., academic articles, journalistic texts) in Spanish, including those with historical, sociological, and literary content. Students will be able to clearly explain their ideas in writing, demonstrating the ability to summarize, interpret, and substantiate an opinion or argument.
- **Metalinguistic awareness.** Students will be able to describe the main features of the Spanish language (e.g., the sound system, the structure of sentences) and will be able to identify the main regional varieties of Spanish. Students will be able to articulate some of the main differences between English and Spanish using precise terminology.
- **Critical analysis.** Students will be able to comment with critical insight on a range of topics and cultural productions (e.g., literary texts, film, music) of the U.S., Latin America, and Spain. They will be able to read closely in order to evaluate historical ideas, arguments, and points of view.
- **Cultural and historical competency.** Students will be able to compare and contrast multiple interpretations of the same phenomena in different cultures. Students will be able to recognize and reflect on the social, cultural, economic, and political changes that connect Latin America, Spain, and U.S. and Latina/o communities.

Major Qualification Policy and Declaration

Process

Major Qualification

To declare the major in Spanish studies, students must have completed SPAN 4 or SPHS 4 at UC Santa Cruz with a grade of C or better or demonstration of proficiency at this level, or place into Level 5 or higher via placement exam.

Transfer students: Please also consult the Transfer Information and Policy section.

SPAN 4	Second-Year Spanish	5
SPHS 4	Spanish for Heritage Speakers	5

Appeal Process

Students notified that they are not eligible to declare the major may appeal this decision by submitting a letter to the department chair within 15 working days from the date of notification. Within 15 working days of receipt of the student's appeal, the department will notify the student and their college of its decision regarding the appeal.

How to Declare a Major

Students should submit a petition to declare as soon as they complete the major qualification requirements or reach their declaration deadline quarter (whichever comes first).

Students petition when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed major qualification courses.

Students must meet major qualification requirements prior to declaring the major.

To declare the major, students must first meet with the faculty advisor and then with the academic advisor. Please contact languages@ucsc.edu for further information.

Transfer Information and Policy

Transfer Admission Screening Policy

Students planning to apply in this major are not required to complete specific major preparation courses for consideration of admission to UC Santa Cruz.

Transfer students are strongly advised to complete courses that will satisfy the campus general education requirements or the Intersegmental General Education Transfer Curriculum (IGETC). In addition, transfer students are strongly encouraged to complete two years of Spanish language study at an accredited two- or four-year institution. While two years of prior Spanish language study is strongly advised, transfer students should be able to complete the Spanish studies major in normative time

as long as they place into Spanish language Level 4 (Level 5 for students entering UC Santa Cruz in the winter term) upon arrival at UC Santa Cruz.

Getting Started at UCSC as a Transfer Student

Transfer students may declare at any time after completing SPAN 4 or SPHS 4 with a grade of C or better, following the process in "How to Declare a Major." Transfer students who place into Spanish Level 5 or higher when they enter UC Santa Cruz can declare the major immediately.

Transfer students should consult an academic advisor at languages@ucsc.edu as soon as possible to learn about language placement tests and other information about the major.

Letter Grade Policy

Courses used to satisfy major requirements may be taken for a Pass/No Pass or letter grade, with the exception that the Level 4 Spanish course and senior comprehensive course must be taken for a letter grade.

[Optional Catchall]

Course Substitution Policy

Double Majors and Major/Minor Combinations Policy

Study Abroad

Spanish studies encourages students to take advantage of the Division of Global Engagement. Some programs do not require prior language study while others have language prerequisites. Many of these programs provide students with the language skills needed to participate in regular university courses taught in the language of the host country. Study abroad opportunities in Spanish include Argentina, Chile, Mexico, Spain, and Costa Rica.

Students who participate in study abroad may petition to apply up to three courses (up to 15 upper-division credits) from study abroad toward the major.

Honors

Students who wish to be considered for honors should meet the deadline posted by the Office of the Registrar for declaring the intent to graduate. Determination of honors is based on the student's grades for all courses relevant to the major and other factors relevant to an assessment of academic excellence, such as research papers of professional quality. Generally, honors in the major are awarded only to students with a GPA of 3.75 or higher in relevant coursework. Only those students whose performance in coursework is excellent will qualify. Highest honors are awarded only to students whose performance in relevant coursework is outstanding (GPA of 3.90 and above) and who have completed an outstanding original research paper.

[Optional Catchall]**Requirements and Planners****Course Requirements**

There are a total of 45 upper-division credits required for the Spanish studies major. See Program Major Requirements below for a breakdown of the credit requirements.

Lower-Division Courses**Either six courses in the regular track**

SPAN 1	First-Year Spanish	5
SPAN 2	First-Year Spanish	5
SPAN 3	First-Year Spanish	5
SPAN 4	Second-Year Spanish	5
SPAN 5	Second-Year Spanish	5
SPAN 6	Second-Year Spanish	5

Or equivalent proficiency

Or three courses in the Spanish for Heritage Speakers (SPHS) track

SPHS 4	Spanish for Heritage Speakers	5
SPHS 5	Spanish for Heritage Speakers	5
SPHS 6	Spanish for Heritage Speakers	5

Or equivalent proficiency

Plus the following course:

LING 50	Introduction to Linguistics	5
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Plus one of the following courses:

HIS 11A	Latin America: Colonial Period	5
HIS 11B	Latin America: National Period	5
HIS 12	Introduction to Latino American History	5

Upper-Division Courses

Four required Spanish studies core courses (20 credits total):

Literature: (5 credits)

Choose one of the following courses:

LIT 189A	De la conquista a Sor Juana	5
LIT 189B	El Siglo XIX en America Latina: cultura, política y sociedad	5

Spanish Studies: (5 credits)*

LIT 189C	Introducción a Spanish Studies	5
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Linguistics: (5 credits)

SPAN 150	Topics in Hispanic Linguistics: Introduction to Hispanic Linguistics	5
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Spanish Language: (5 credits)

Choose one of the following courses:

SPAN 114	Advanced Conversation and Composition	5
SPHS 115	El ensayo lectura, analisis y redaccion	5

*LIT 189C/SPAN 105 and SPAN 150 must be taken prior to enrollment in or in conjunction with concentration courses.

Choice of Concentrations**Languages and Linguistics Track**

Three courses from the following list that are not used as an elective or capstone:

SPAN 140	Sounds of Spanish	5
SPAN 151	Topics in Hispanic Linguistics: Varieties of Spanish	5
SPAN 152	Topics in Hispanic Linguistics: Spanish in the U.S.	5
SPAN 153	Topics in Hispanic Linguistics: Spanish as a Second Language	5
SPAN 154	Topics in Hispanic Linguistics: Spanish Pragmatics	5
SPAN 156A	The Language of Latin America Cinema	5
SPAN 156E	Spanish Culture	5
SPAN 156F	El Humor en Espanol	5
SPAN 156J	Contemporary Central America	5
SPAN 156K	Spanish Discourse Analysis	5
SPAN 156M	Mexico and the Southwest	5
SPAN 141	Advanced Spanish Grammar	5

Other 5-credit Spanish-language courses numbered SPAN 100-SPAN 189, SPAN 199 (except SPAN 114, SPAN 150, SPHS 115, and LIT 189C/SPAN 105) may be accepted with the permission of the Spanish studies director (or faculty advisor).

Literature and Culture Track

Any three 5-credit literature courses numbered LIT 188- LIT 189, LIT 199. The courses LIT 189C/SPAN 105, LIT 189A, and LIT 189B may not be taken as a concentration or elective course if used as a core course.

LIT 188A	Literatura medieval	5
LIT 188B	Literatura peninsular: de los orígenes al siglo XVIII	5

LIT 188E	Teatro del Siglo de Oro español	5	HAVC 160A	Indigenous American Visual Culture Before 1550: Mexico	5
LIT 188G	Literaturay vida en Don Quijote y otros textos cervantinos	5	HAVC 160B	Indigenous American Visual Culture Before 1550: The Andes	5
LIT 188H	Erotismo y Mistica	5	HAVC 162A	Advanced Studies in Early Indigenous American Visual Culture: The Ancient Maya	5
LIT 188I	La novela picaresca	5	HAVC 163	The Native in Colonial Spanish America	5
LIT 188M	Literatura peninsular: siglos XIX y XX	5	HAVC 162B	Advanced Studies in Early Indigenous American Visual Culture: The Inka	5
LIT 189F	Literaturas Latinas en los Estados Unidos: en inglés, español y Spanglish	5	HAVC 191B	The Virgin of Guadalupe: Images and Symbolism in Spain, Mexico, and the U.S	5
LIT 189G	Cine y Literatura	5	LALS 100	Concepts and Theories in Latin American and Latina/o Studies	5
LIT 189H	La Globalizacion en/del Cine Latin/o Americano	5	LALS 100B	Cultural Theory in the Americas	5
LIT 189I	Literatura e indigeneidad	5	LALS 115	Mexico-United States Migration	5
LIT 189L	Poesía latinoamericana	5	LALS 122	Media and Nationalism	5
LIT 189M	Prosa contemporánea hispanoamericana	5	LALS 127	Genero, Nacion Y Modernidad En El Cine	5
LIT 189N	Latinoamericano testimonio	5	LALS 130	Expresiones cuirs de Genero y Sexualidad en el cine Latinoamericano	5
LIT 189O	El Cuento Hispanoamericano: Variedades esteticas de la literatura breve en America Latina	5	LALS 133	Latina/o Art and Representation	5
LIT 189Q	Ficción y marginalidad	5	LALS 144	Mexicana/Chicana Histories	5
LIT 189S	La cultura popular en la narrativa latinoamericana	5	LALS 145	Grassroots Social Change in Latin America	5
LIT 189T	Historia de la lectura y los lectores: Recepcion y consumo cultural en el mundo Latino Americano	5	LALS 152	Consumer Cultures Between the Americas	5
LIT 189U	Modernidad y literatura: El Boom de la novela latinoamericana	5	LALS 155	Latin American and Latino Youth Movements	5
LIT 189V	Andean Indigenismo	5	LALS 157	Revoluciones Sociales	5
LIT 189X	Estudios mediaticos	5	LALS 155	Latin American and Latino Youth Movements	5
			LALS 165	Contemporary Peru	5
			LALS 172	Visualizing Human Rights	5
			LALS 175	Migration, Gender, and Health	5
			LING 182	Structure of Spanish	5
			LIT 155E	Cinema and Social Change in Latin America	5
			POLI 140C	Latin American Politics	5
			SOCY 156	U.S. Latinx Identities: Centers and Margins	5
			SOCY 177A	Latinos/as and the American Global City	5
Electives					
Electives (one upper-division course, 5 credits total): Choose from related 5-credit courses in Anthropology, Education, Feminist Studies, History, History of Art and Visual Culture, Latin American and Latino Studies, Linguistics, Sociology (see Elective Courses below), or any upper-division Spanish literature and culture or Spanish language and linguistics concentration courses not taken for concentration credit or capstone requirement.					
ANTH 130L	Ethnographies of Latin America	5			
ANTH 130M	Inside Mexico	5			
ANTH 176B	Meso-American Archaeology	5			
FMST 115	Gender, Sexuality, and Transnational Migration Across the Americas	5			
FMST 175	Gender and Sexualities in Latina/o America	5			
HAVC 143C	Latin American Modern Architecture	5			
Disciplinary Communication (DC) Requirement					
The Disciplinary Communication requirement (DC requirement) is satisfied by successfully completing one of the following courses:					
			SPAN 114	Advanced Conversation and Composition	5

SPHS 115 El ensayo lectura, analisis y redaccion 5

Comprehensive Requirement

In their senior year, Spanish studies majors must satisfy the senior comprehensive requirement as described below:

Successful completion of a capstone course (a designated upper-division course taught in Spanish, 5 credits total). in the student's chosen concentration: language and linguistics, or literature and culture.

Students must have senior standing and have completed at least three out of four core courses. The comprehensive course requirement is in addition to the three upper-division concentration courses; the same course cannot be used for both.

Languages and Linguistics Capstone Courses

SPAN 151 Topics in Hispanic Linguistics: Varieties of Spanish 5
 SPAN 152 Topics in Hispanic Linguistics: Spanish in the U.S. 5
 SPAN 153 Topics in Hispanic Linguistics: Spanish as a Second Language 5
 SPAN 154 Topics in Hispanic Linguistics: Spanish Pragmatics 5

Literature and Culture Capstone Course

LIT 190X Temas de la literatura y cultura espanolas y latinoamericanas 5

Planners

Four-Year Planner for Non-Spanish Heritage Speakers

	Fall	Winter	Spring
1st (frosh)	SPAN 1	SPAN 2	SPAN 3
2nd (soph)	SPAN 4 LING 50	SPAN 5 HIS 12	SPAN 6
3rd (junior)	SPAN 105/LIT 189C SPAN 114 or SPHS 115	SPAN 150 Elective	LIT 189A or 189B

4th (senior)	Concentration 1	Concentration 3
	Concentration 2	Capstone*

*Depending on the student's choice of concentration and capstone course, the term in which the course is taught will vary.

Four-Year Planner for Spanish Heritage Speakers

	Fall	Winter	Spring
1st (frosh)	SPHS 4	SPHS 5	SPHS 6
2nd (soph)	LING 50	HIS 12	SPAN 114 or SPHS 115
3rd (junior)	SPAN 105/LIT 189C	SPAN 150 Elective	LIT 189A or LIT 189B

4th (senior)	Concentration 1	Concentration 3
	Concentration 2	Capstone*

*Depending on the student's choice of concentration and capstone course, the term in which the course is taught will vary.

Transfer Planner

	Fall	Winter	Spring
1st (junior)	SPHS 4/SPAN 4 LING 50	SPHS 5/SPAN 5 HIS 12	SPHS 6/SPAN 6
2nd (senior)	SPAN 105/LI	LIT 189A or LIT 189B	Elective

)	T 189C		
	SPAN 114 or SPHS 115	Concentratio n 1	Concentratio n 3
	SPAN 150	Concentratio n 2	Capstone

This planner assumes that a student places into Level 4 or higher of the language they are studying when they enter UCSC.

SPANISH STUDIES MINOR

Course Requirements

There are a total of 25 upper-division credits required for the Spanish minor. See Program Minor Requirements below for a breakdown of the credit requirements.

Lower-Division Courses

Either six courses in the regular track (SPAN 5 or SPAN 5M)

SPAN 1	First-Year Spanish	5
SPAN 2	First-Year Spanish	5
SPAN 3	First-Year Spanish	5
SPAN 4	Second-Year Spanish	5
SPAN 5	Second-Year Spanish	5
SPAN 5M	Medical Spanish	5
SPAN 6	Second-Year Spanish	5

Or three courses in the Spanish for Heritage Speakers (SPHS) track

SPHS 4	Spanish for Heritage Speakers	5
SPHS 5	Spanish for Heritage Speakers	5
SPHS 6	Spanish for Heritage Speakers	5

or equivalent proficiency

Plus the following course

LING 50	Introduction to Linguistics	5
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Upper-Division Courses

Four required Spanish studies core courses (20 credits total), in addition to one upper-division Spanish studies elective course (5 credits total):

Literature (5 credits)

Choose one of the following courses:

LIT 189A	De la conquista a Sor Juana	5
LIT 189B	El Siglo XIX en America Latina: cultura, política y sociedad	5

Spanish Studies (5 credits)

LIT 189C	Introducción a Spanish Studies	5
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Linguistics (5 credits)

SPAN 150	Topics in Hispanic Linguistics: Introduction to Hispanic Linguistics	5
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Spanish Language (5 credits)

Choose one of the following courses:

SPAN 114	Advanced Conversation and Composition	5
SPHS 115	El ensayo lectura, analisis y redaccion	5

Spanish Elective (5 credits)

Choose one of the following courses:

LIT 188Z	Literatura de España	5
LIT 188A	Literatura medieval	5
LIT 188B	Literatura peninsular: de los orígenes al siglo XVIII	5
LIT 188E	Teatro del Siglo de Oro español	5
LIT 188F	Cuentos del Siglo de Oro español	5
LIT 188G	Literaturay vida en Don Quijote y otros textos cervantinos	5
LIT 188H	Erotismo y Mistica	5
LIT 188I	La novela picaresca	5
LIT 188L	Literatura de la guerra civil española	5
LIT 188M	Literatura peninsular: siglos XIX y XX	5
LIT 188R	Humanidades Ambientales	5
LIT 188Z	Literatura de España	5
LIT 189D	Sor Juana Ines de la Cruz	5
LIT 189E	Cuba	5
LIT 189F	Literaturas Latinas en los Estados Unidos: en inglés, español y Spanglish	5
LIT 189G	Cine y Literatura	5
LIT 189H	La Globalizacion en/del Cine Latin/o Americano	5
LIT 189I	Literatura e indigeneidad	5
LIT 189K	El ensayo latinoamericano	5
LIT 189L	Poesía latinoamericana	5
LIT 189M	Prosa contemporánea hispanoamericana	5
LIT 189N	Latinoamericano testimonio	5
LIT 189O	El Cuento Hispanoamericano: Variedades esteticas de la literatura breve en America Latina	5
LIT 189P	Las mujeres en la literatura latinoamericana	5
LIT 189Q	Ficción y marginalidad	5
LIT 189R	La Novela de la Dictadura	5

LIT 189S	La cultura popular en la narrativa latinoamericana	5
LIT 189T	Historia de la lectura y los lectores: Recepcion y consumo cultural en el mundo Latino Americano	5
LIT 189U	Modernidad y literatura: El Boom de la novela latinoamericana	5
LIT 189V	Andean Indigenismo	5
LIT 189X	Estudios mediaticos	5
LIT 189Z	Literatura de Chile	5
SPAN 140	Sounds of Spanish	5
SPAN 141	Advanced Spanish Grammar	5
SPAN 151	Topics in Hispanic Linguistics: Varieties of Spanish	5
SPAN 152	Topics in Hispanic Linguistics: Spanish in the U.S.	5
SPAN 153	Topics in Hispanic Linguistics: Spanish as a Second Language	5
SPAN 154	Topics in Hispanic Linguistics: Spanish Pragmatics	5
SPAN 156A	The Language of Latin America Cinema	5
SPAN 156E	Spanish Culture	5
SPAN 156F	El Humor en Espanol	5
SPAN 156J	Contemporary Central America	5
SPAN 156K	Spanish Discourse Analysis	5
SPAN 156M	Mexico and the Southwest	5

Teaching English as a Second or Other Language

The TESOL (Teaching English as a Second or Other Language) certificate is useful for students who wish to teach English as second or additional language, whether in the United States or overseas. This certificate can verify students' training in the content required for many English language teaching positions around the world.

The TESOL certificate is not limited to applied linguistics and multilingualism majors. Students in related fields are welcome to earn this certificate. The certificate requires the completion of six courses (LING 50, APLX 101, APLX 113, APLX 135, APLX 136, and APLX 138).

In order to register for the TESOL certificate, students should make an appointment with the faculty director of the applied linguistics and multilingualism major (<https://language.ucsc.edu/>) as early as possible in their academic career.

REQUIRED COURSES

There are six required courses for this certificate (prerequisites in parentheses):

1. LING 50: Introduction to Linguistics (already approved requirement for the APLX major)
2. APLX 101: Second Language Acquisition (APLX 80 or LING 50)
3. APLX 113: Intercultural Communication (junior or senior standing)
4. APLX 135: Second Language Teaching (junior or senior standing)
5. APLX 136: Second Language Assessment (APLX 135)
6. APLX 138: English Grammar for TESOL (APLX 80 or LING 50)

Linguistics

239 and 241 Stevenson College
(831) 459-4765 (graduate)
(831) 459-4988 (undergraduate)
<https://linguistics.ucsc.edu>

PROGRAMS OFFERED

- Linguistics B.A. (p. 185)
- Linguistics Minor (p. 191)
- Language Studies B.A. (p. 191)
- Language Studies Minor (p. 197)
- Contiguous Bachelor's/Master's Pathway (p. 197)
- Linguistics M.A. (p. 198)
- Linguistics Ph.D. (p. 199)

OTHER PROGRAMS OF INTEREST

- Applied Linguistics and Multilingualism B.A. (p. 173)
- Cognitive Science B.S. (p. 702)
- Computer Science B.S. (p. 479)
- Computer Science B.A. (p. 484)
- Natural Language Processing M.S. (p. 502)

Linguistics is an exact and structured discipline that examines human language. It has connections to many other fields in the humanities (philosophy, literature), the social sciences (anthropology, psychology, sociology), the natural sciences (biology, neuroscience, acoustics), computer science, computer engineering, and artificial intelligence.

The central areas of linguistics investigate the knowledge that speakers of a language have about its structure. Syntax is concerned with the rules that combine words into larger units of phrases and sentences. Semantics is

the study of the meanings of linguistic units and how they are combined to form the meanings of sentences. Phonetics deals with the physical properties of language sounds. Phonology investigates the sound systems of particular languages and across languages. Morphology investigates the ways in which words are formed from prefixes, roots, and suffixes. Pragmatics is the study of language use. Psycholinguistics is concerned with the cognitive mechanisms by which language is put to use in producing and perceiving speech.

The faculty in the Linguistics Department have primary research and teaching interests in one or more of these areas. Other perspectives on language study represented include computational and corpus linguistics, sociolinguistics, the study of poetic language, and the study of language change.

The programs offered by the Linguistics Department are designed to acquaint students with the central aspects of linguistic structure and the methodologies and perspectives of the field. The department offers two undergraduate majors, linguistics and language studies, and a graduate program in theoretical linguistics. The linguistics major leads to a bachelor of arts (B.A.) degree in linguistics; the language studies major leads to a B.A. degree in language studies (see Language Studies). The graduate program leads to the master of arts (M.A.) and doctor of philosophy (Ph.D.) degrees in linguistics.

The department also offers a combined B.A./M.A. pathway which makes it possible for certain well-qualified, highly motivated students to complete the requirements for both degrees in five years rather than the usual six.

COURSES FOR NON-MAJORS

LING 50, Introduction to Linguistics, an introduction to the major areas, problems, and techniques of modern linguistics. (Gen Ed: SI)

LING 53, Semantics I, introduction to the logical foundations of natural language semantics. A basic literacy course in the language of logical representation. (Gen Ed: MF)

LING 80C, Language, Society and Culture, the study of language from a sociological perspective. Multilingualism, language change and variation, pidgins and creoles, the origin and diversification of dialects. (Gen Ed: CC)

LING 80D, Language and Mind, a critical overview of the research program initiated by Noam Chomsky and its implications for theories of the human mind and brain. (Gen Ed: PE-H)

LING 80K, Invented Languages, explores invented languages, including Elvish and Klingon, as well as lesser-known ones that tackle ethical, social, or cognitive concerns. (Gen Ed: TA)

LING 80M, Language and Indigeneity in Mesoamerica, explores indigenous experiences in Mesoamerica, focusing on the role of language in the formation of indigenous identities, both historically and in contemporary society. (Gen Ed: ER)

LING 80S, The Science of Language, an introduction to linguistics for non-majors. (Gen Ed: SI)

LING 80V, Structure of the English Vocabulary, explores the historical origin and development of word elements, as well as their sound, meaning, and function in the contemporary language.

LING 131, Spanglish, an investigation of Spanglish as a linguistic and cultural phenomenon.

LING 133, Language OnLine (LOL): Communication in the digital era, an investigation of the language of memes and social media

LINGUISTICS B.A.

Information and Policies

Introduction

Linguistics is an exact and structured discipline that examines human language. It has connections to many other fields in the humanities (philosophy, literature), the social sciences (anthropology, psychology, sociology), the natural sciences (biology, neuroscience, acoustics), computer science, computer engineering, and artificial intelligence.

The central areas of linguistics investigate the knowledge that speakers of a language have about its structure. Syntax is concerned with the rules that combine words into larger units of phrases and sentences. Semantics is the study of the meanings of linguistic units and how they are combined to form the meanings of sentences. Phonetics deals with the physical properties of language sounds. Phonology investigates the sound systems of particular languages and across languages. Morphology investigates the ways in which words are formed from prefixes, roots, and suffixes. Pragmatics is the study of language use. Psycholinguistics is concerned with the cognitive mechanisms by which language is put to use in producing and perceiving speech.

Academic Advising for the Program

241 Stevenson College
(831) 459-4988
ling@ucsc.edu

Undergraduate Advisor

The undergraduate advisor can advise you about requirements for the major, about prerequisites, and about many other aspects of your academic progress. During the academic year, there are regular drop-in office hours available and posted on the department website.

If none of the drop-in office hours work for you, email the undergraduate advisor at ling@ucsc.edu for an appointment.

Transfer students, please also refer to **Transfer Information and Policy**.

Peer Advisors

During the academic year, the department has a peer advising program to provide an additional advising resource for undergraduate majors. The peer advisors are advanced students in the major who volunteer their time and expertise to provide guidance and advice to other students. They hold regular office hours and provide one-on-one advising in the Linguistics Department office at Stevenson College (STEV 245). Peer advisors do not have signature authority on forms (i.e., Declaration of Major Petitions and study abroad planning forms). Students must see the undergraduate advisor for any forms requiring a department signature. We encourage any prospective and current linguistics majors to stop by during the peer advisors' office hours if they have questions about the linguistics program.

Faculty

You should feel free to meet with any faculty member for advising, but it may make sense to speak with the undergraduate advisor first, to find out which faculty member might be best placed to advise you about your interests or concerns. You can find the current office hours for all faculty members in the faculty directory. For issues specifically related to the undergraduate program, you can turn to the Undergraduate Program director.

Getting Started in the Major

Here are four tips to keep in mind when embarking on your major in linguistics:

- Meet with a peer advisor to create your academic plan and get questions answered about your major.
- Determine how many language courses you need in order to fulfill your language competency requirement, as specified in the **Requirements and Planners** section. Begin any necessary language instruction as soon as possible. Visit the Languages and Applied Linguistics Department website to find out about language placement, articulation and course offerings. Many language placement exams take place just before classes start in September. You may opt to satisfy the mathematics/computer science requirement instead.
- Take at least one introductory linguistics course in your first year, and plan to take at least syntax and phonology in your second year. (Junior transfers: take all of these courses in your first year.) If linguistics is not for you, you should find this out early, in order to consider a change in your plans.

- Plan to complete the bulk of your general education requirements early on. The sophomore, junior, and senior years can fill up quickly with major requirements (especially if you are planning to study abroad). Also, as general education courses are often lower-division courses, it can be frustrating to have to take them in the final quarters of your career, when you would like to take more advanced courses.

Program Learning Outcomes

The program learning outcomes for the linguistics major are the following:

1. **Analytical Thinking**
Students will formulate testable hypotheses, and present them clearly and completely. Students will accurately and insightfully use relevant evidence to evaluate hypotheses and determine routes for future investigation.
2. **Writing**
Students will formulate well-organized written arguments. At the micro-level, sentences will be grammatical, follow appropriate conventions, and strike an appropriate balance of clarity and complexity. At the macro-level, sentences will be linked together into paragraphs, and paragraphs into logical sections of a larger document.
3. **Properties of Language**
Students will apply analytical techniques to identify general properties of language, including but not limited to sound structure, word structure, sentence structure, meaning, use, and language processing. Students will explain the significance of relevant universal properties in some domain.
4. **Linguistic Theory and Investigation**
Students will demonstrate an active command of linguistic theory and linguistic investigation in at least one area of linguistic theory, including but not limited to morphology, phonetics, phonology, pragmatics, psycholinguistics, syntax, and semantics.
5. **Second Language Proficiency or Mathematics Competency**
Linguistics majors will demonstrate either competence in the mathematical foundations of theories used in linguistics **or** proficiency in a second language at or above the intermediate-high level.

Major Qualification Policy and Declaration Process

Major Qualification

The Linguistics Department has adopted a major qualification policy for linguistics majors that is intended to encourage students to take their performance in the

gateway courses seriously and to help them lay a solid foundation for further course work in the major.

Transfer students, please also refer to **Transfer Information and Policy**.

In order to declare the linguistics major, a student must pass two gateway courses, with a grade of C+ or better in each:

LING 50	Introduction to Linguistics	5
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And one of the following courses:

LING 53	Semantics I	5
LING 101	Phonology I	5
LING 112	Syntax I	5
LING 171	Psycholinguistics I	5

Appeal Process

Students who are informed that they are not eligible to declare the major may appeal the decision within 15 days from the date the notification was mailed. They should do this by submitting a formal letter, addressed to the department's undergraduate program director, to the Linguistics Department office (Stevenson 241 or 243). This letter should explain any extenuating circumstances that influenced performance in the gateway courses. Within 15 days of receipt of the appeal, the department will notify the student of the decision.

How to Declare a Major

You should formally declare your major as early as possible in your academic career. Doing so will mean you get helpful advising. It will require you to plan out all the courses of the major. This means you will know you have time to meet all the necessary requirements for linguistics before you graduate.

Once you have successfully completed the two gateway courses, please meet with the department advisor or a peer advisor, to complete or update your academic plan. If you are declaring a second major, please first complete an Academic Planning Form with the advisor for your declared major.

To declare the major, you must attend one of the department's Declaration and Orientation Meetings. These sessions are held in the first month of each quarter. Invitations to sign up for a declaration session are sent out by the first week of the quarter to all proposed majors through the Slug Success system. If you have completed the gateway courses, and you do not receive an invitation by Week 2, please contact the department advisor for assistance. Please sign up well in advance, as these meetings tend to fill quickly.

The campus undergraduate advising website has further helpful information about declaring a major.

Transfer Information and Policy

Transfer Admission Screening Policy

No major preparation courses are required prior to transfer for consideration of admission to UC Santa Cruz.

While not required for selection, transfer students are strongly encouraged to complete as much preparation as possible in the foreign language of their choosing. Transfer students admitted to UC Santa Cruz for the winter term who do not place into Level 2 or higher in a language placement test when they enter UC Santa Cruz may not be able to complete the major in a timely manner. Bear in mind that placement exams, and the resulting credit for the major, are only available for languages taught at UC Santa Cruz.

Prospective students are also encouraged to complete the Intersegmental General Education Transfer Curriculum (IGETC) or to complete all UC Santa Cruz general education requirements before matriculation.

Getting Started at UC Santa Cruz as a Transfer Student

Consult with the undergraduate advisor before enrolling for your first term, to create a two-year plan. Some required courses are only offered once a year, and careful planning is essential. Plan to take LING 50 and LING 53 in your first quarter, along with a language course. If you expect to test out of level 5 in your chosen language, or plan to complete the Mathematics/Computer Science competency requirement, you need not enroll in a language course. Transfer students can declare the major in their second quarter, after completing two gateway courses with a C+ or better.

Letter Grade Policy

The two qualifying courses for the major must be completed with a grade of C+ or better. Once you qualify, there is no requirement that courses for the major be taken for a letter grade. There is a campuswide requirement that you need to be aware of and to keep track of (no more than 25 percent of all of your UC Santa Cruz courses can be taken on a Pass/No Pass basis). Further information about campus letter grade policy is available at the website of the Office of the Registrar.

[Optional Catchall]

Course Substitution Policy

Students may petition the department to have elective courses offered through other institutions or other UC programs applied toward the major requirements. At most three such courses can be applied toward the major. These courses must be upper-division and clearly fit into a coherent program of study in linguistics. The list of approved courses from other UC Santa Cruz departments is given below:

ANTH 139	Language and Culture	5
APLX 101	Second-Language Acquisition	5

APLX 102	Bilingualism	5	Study abroad does require careful planning, especially for those who wish to pursue a year-long program, or who wish to study abroad during the senior year. Meeting with your major advisor early and often throughout the Study Abroad planning process is encouraged. Before being approved for UC Education Abroad Program (EAP), you must declare your major. Also, majors must complete LING 101, and either LING 111 or LING 112, before they leave for any EAP programs that take place during the academic year. The department does not place any restrictions on summer study abroad.
APLX 112	Language and Gender	5	
APLX 113	Inter-Cultural Communication	5	
APLX 115	Language and Power	5	
APLX 116	Discourse Analysis: Language Use and Context	5	
APLX 122	Linguistic Diversity & Social Justice	5	
APLX 124	Second Language Variation and Sociolinguistics	5	
APLX 135	Second Language Teaching	5	
APLX 138	English Grammar for TESOL	5	
CSE 103	Computational Models	5	
CSE 110A	Fundamentals of Compiler Design I	5	
CSE 140	Artificial Intelligence	5	
CSE 143	Introduction to Natural Language Processing	5	
FREN 114	French Phonetics	5	
FREN 120	French Linguistics	5	
FREN 121	History of the French Language	5	
LIT 102	Translation Theory	5	
PHIL 117	Non-Classical Logic	5	
PHIL 119	Intermediate Logic	5	
PHIL 123	Philosophy of Language	5	
PSYC 125	The Psychology of Language	5	
SPAN 140	Sounds of Spanish	5	
SPAN 150	Topics in Hispanic Linguistics: Introduction to Hispanic Linguistics	5	
SPAN 151	Topics in Hispanic Linguistics: Varieties of Spanish	5	
SPAN 152	Topics in Hispanic Linguistics: Spanish in the U.S.	5	
SPAN 153	Topics in Hispanic Linguistics: Spanish as a Second Language	5	

If you plan to study abroad during your senior year, and do not plan to return to UC Santa Cruz before graduating, your plan will be approved only when all major requirements have been completed prior to departure, and/or when it is clear that any remaining requirements can be satisfactorily completed abroad. Please consult with the department advisor before the end of your sophomore year if you are considering this option.

Most importantly: Students who wish to have a study-abroad course count toward the major must bring back syllabi, completed papers, and course evaluations to the department, so that the department can make a decision about whether the course satisfies a major requirement. Ideally, students should have courses pre-approved for the major before they go abroad. Students can visit the UCSC Campus Credit Abroad database to find pre-approved courses. A maximum of three outside courses may be used toward the major.

Students who are interested in studying abroad should contact the Global Learning Office (105 Classroom Unit, 459-2858). Global Learning staff can provide detailed information concerning EAP selection criteria and application procedures. The first step in preparing to study abroad is to set up a profile on the Global Learning website.

Honors

Students who wish to be considered for honors should meet the deadline posted by the Office of the Registrar for declaring the intent to graduate. It is important to minimize the number of major courses you take on a Pass/No Pass basis. Determination of honors is based on the student's grades for all courses relevant to the major and other factors relevant to an assessment of academic excellence, such as research papers of professional quality. Generally, honors in the major are awarded only to the top 10 percent of those graduating in the major. Only those students whose performance in coursework is excellent will qualify. Highest honors are rarely awarded, and then only to students whose performance in coursework is outstanding and who have completed an outstanding senior thesis.

Preparation for the UC Santa Cruz Master's Degree

Every year, UC Santa Cruz undergraduates in the final year of their linguistics major can apply to be admitted into the graduate program to pursue the M.A. in

Double Majors and Major/Minor Combinations Policy

A student may **not** double major or major/minor in linguistics and language studies, as there is too much overlap between the two programs.

Study Abroad

Students majoring in linguistics should consider studying abroad in the course of their degree program. Studying abroad is a good way to cultivate and enhance your language skills, as well as to gain rich life experiences. Linguistics students have various opportunities to study abroad, for a summer, quarter, semester, or year. There are programs available for students of all levels of language ability, from language and culture programs for beginning or intermediate speakers, to full immersion programs for students with advanced language skills.

theoretical linguistics. Interested students should discuss the possibility with one or more faculty members and formally apply online to the graduate program during the fall quarter of the senior year. For up-to-date information about the application process, consult the Linguistics Department's website; and see the graduate coordinator. The combined B.A./M.A. program provides another pathway to the M.A. program.

Information About Linguistics Courses

The 80-level courses have no prerequisites. Although most of them will fulfill a general education requirement, they do not fulfill any requirements for the major. They are intended to introduce the concepts of linguistics through their relation to other areas of general interest.

LING 50, Introduction to Linguistics, introduces the subfields of the discipline. LING 53, Semantics I; LING 100, Phonetics I; LING 101, Phonology I; LING 112, Syntax I; and LING 171, Psycholinguistics I, serve as entry courses to the specialized upper-division sequences. Upper-division courses often have at least two of these courses as a prerequisite.

A variety of upper-division elective courses are offered each quarter. For a list of the current offerings, please see the department website.

To enroll in the graduate (200-level) courses, undergraduates need special permission from the instructor. Permission is usually granted only to especially motivated undergraduates who have completed all the named requirements for the major with excellent performance.

Requirements and Planners

Course Requirements

Lower-Division Courses

LING 50	Introduction to Linguistics	5
LING 53	Semantics I	5

Foreign-Language/Mathematics Competency Requirement:

Linguistics majors are required to demonstrate either foreign-language or mathematics competency as follows:

Students must successfully complete five quarters of language study at UC Santa Cruz or demonstrate an equivalent level of competence through a recognized language test or evidence of credit from another institution. In cases where five quarters of instruction for a language are not offered at UC Santa Cruz, students may opt to complete (or demonstrate equivalent level of competence for) three quarters of one language and three quarters of a second language. For Latin or Greek, three of the designated courses will be equivalent to all five levels.

Or

Alternatively, students with a strong formal background can choose to satisfy the mathematics/computer science competency requirement by demonstrating sufficient preparation in mathematics for advanced formal work in linguistics. This requirement is satisfied by passing **two** courses chosen from the following list:

CSE 5J	Introduction to Programming in Java	5
CSE 10	Introduction to Computer Science	5
CSE 16	Applied Discrete Mathematics	5
CSE 20	Beginning Programming in Python	5
CSE 140	Artificial Intelligence	5
MATH 100	Introduction to Proof and Problem Solving	5
MATH 160	Mathematical Logic I	5
MATH 161	Mathematical Logic II	5
PHIL 9	Introduction to Logic	5
STAT 5	Statistics	5
STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 131	Introduction to Probability Theory	5

Any course which has one of the courses listed above as a prerequisite may also be used toward the mathematics/computer science competency requirement.

Upper-Division Courses

Students in the linguistics major are required to complete a total of 10 upper-division courses in linguistics and related disciplines, including seven named courses in linguistics:

LING 100	Phonetics I	5
LING 101	Phonology I	5
LING 171	Psycholinguistics I	5

Plus one of the following courses:

LING 111	Syntactic Structures	5
LING 112	Syntax I	5

And three of the following courses:

LING 102	Phonology II	5
LING 113	Syntax II	5
LING 116	Semantics II	5
LING 151	Phonetics II	5
LING 172	Psycholinguistics II	5

Electives

The major requires three upper-division elective courses in linguistics. Upper-division linguistics electives include any upper-division course offered by the Linguistics Department (except courses LING 100, LING 101, LING 111, LING 112, and LING 171). See Course Substitution Policy in the Information and Policies section of the catalog for information on substituting courses outside the department to meet this requirement.

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement in linguistics is satisfied by completing:

LING 101 Phonology I 5

Plus one of the following courses:

LING 111 Syntactic Structures 5

LING 112 Syntax I 5

Comprehensive Requirement

Senior exit requirement: In their senior year, linguistics majors must satisfy the senior exit requirement in one of three ways:

Option 1

Capstone course: Students complete a 2-credit senior research course, LING 190. Each instance of LING 190 is taught concurrently with one of the upper-division electives offered in that quarter. Students must enroll in **both** an instance of LING 190 (the **senior research course**) and its associated upper-division elective (the **capstone course**). This capstone course can also serve as one of the three linguistics electives required for the major.

Students must enroll concurrently in an upper-division elective and in the corresponding instance of the following course:

LING 190 Senior Research 2

Option 2

Senior thesis supervised by a faculty member. The proposal for a senior thesis must be submitted for approval by the department faculty at least three quarters prior to the quarter of graduation.

Students enroll in the following course:

LING 195 Senior Thesis 5

Option 3

By exception, students in their senior year may enroll in a **graduate-level class**, by permission of instructor. This option is for students who have performed exceptionally in the available undergraduate courses in a particular sub-discipline of the field. Under these conditions, a graduate-level course may satisfy the senior exit requirement.

Planners

Four-Year Linguistics Students

The following planner is a recommended academic plan for **four-year students** who wish to pursue the linguistics major.

Year	Fall	Winter	Spring
1st (frosh)	College 1		WRIT 2

LING 50

2nd (soph)

LING 53

LING 100

LING 101

Foreign language level 1

Foreign language level 2

Foreign language level 3

3rd (junior)

LING 112

LING 116 or LING 1XX elective

LING 113 or LING 1XX elective

LING 171

4th (senior)

Foreign language level 4

Foreign language level 5

LING 102 or LING 1XX elective

LING 1XX upper div elective

LING 190*

LING 1XX upper-div elective

LING 1XX capstone course

*This is a 2-credit course.

In addition to the specific courses shown in these planners, a student must complete courses satisfying the general education requirements. The courses in the four-year planner cover at least the following GE requirements: C, MF, SI, SR.

Linguistics Transfer Students

The following planner is a recommended academic plan for **junior transfer students** who wish to pursue the linguistics major.

Year	Fall	Winter	Spring
3rd (junior)	LING 50	LING 112	LING 101
	LING 53	LING 100	LING 171
	Foreign language level 1	Foreign language level 2	Foreign language level 3
4th (senior)	LING 102 or LING 1XX elective	LING 116 or LING 1XX elective	LING 113 or LING 1XX elective
	LING	LING	LING

1XX upper-div elective	1XX upper-div elective	1XX capstone course
Foreign language level 4	Foreign language level 5	LING 190*

*This is a 2-credit course.

This planner assumes that a student has completed any required general education courses—including UC Santa Cruz or community college general education requirements—before coming to UCSC. This can be accomplished by completing the Intersegmental General Education Transfer Curriculum (IGETC).

Additional planning templates are available on the department website.

LINGUISTICS MINOR

Course Requirements

Lower-Division Courses

LING 50	Introduction to Linguistics	5
LING 53	Semantics I	5

Upper-Division Courses

At least two of the following level one courses

LING 100	Phonetics I	5
LING 101	Phonology I	5
LING 111	Syntactic Structures	5
LING 112	Syntax I	5
LING 171	Psycholinguistics I	5

And three upper-division elective courses in linguistics

Upper-division linguistics electives for the minor include any upper-division course offered by the Linguistics Department, with one exception: **Students may not apply both LING 111 and LING 112 to the minor.** There is no foreign language/mathematics competency requirement for the minor.

Course Substitution Policy

Students may petition the department to have elective courses offered through other institutions or other University of California programs applied toward the minor requirements. At most two such courses can be applied toward the minor. These courses must be upper-division and clearly fit into a coherent program of study in linguistics. A list of approved courses from other UC Santa Cruz departments is available in the Course Substitution Policy section of the Linguistics B.A. program statement. A list of approved outside courses being offered in the current or upcoming term may be found on the department website.

LANGUAGE STUDIES B.A.

Information and Policies

Introduction

Language studies is an interdisciplinary major offered by the Linguistics Department. It is designed to equip students with advanced competence in a foreign language and, at the same time, provide them with an understanding of the general nature of human language—its structure and use. The major also provides an opportunity to explore the culture or cultures connected with the language of concentration. The cultural context electives may include courses in art, history, literature or politics. Currently, majors may choose a concentration in Chinese, French, German, Italian, Japanese, or Spanish. Interested students should contact the Linguistics Department office early in their college careers to obtain essential information about requirements. The requirements for the major may also be found in the **Requirements and Planners tab**.

Students interested in spending a portion of a year or a full year studying abroad should review the UCSC Study Abroad website. A senior year abroad is approved only when all of the language proficiency requirements have been satisfied and when it is clear that any remaining courses can be satisfactorily completed abroad. Courses taken abroad may be used to satisfy major requirements only if approved by the undergraduate program director or a designated advisor. A maximum of three outside courses may be used toward the major.

Academic Advising for the Program

241 Stevenson College
(831) 459-4988
ling@ucsc.edu

Undergraduate Advisor

The undergraduate advisor can advise you about requirements for the major, about prerequisites, and about many other aspects of your academic progress. During the academic year, there are regular drop-in office hours available and posted on the department website.

If none of the drop-in office hours work for you, email the undergraduate advisor at ling@ucsc.edu for an appointment.

Transfer students, please also refer to Transfer Information and Policy.

Peer Advisors

During the academic year, the department has a peer advising program to provide an additional advising resource for undergraduate majors. The peer advisors are advanced students in linguistics or language studies who volunteer their time and expertise to provide guidance and advice to other students. They hold regular office hours and provide one-on-one advising in the Linguistics Department office at Stevenson College (245 Stevenson).

Peer advisors do not have signature authority on forms (i.e., Declaration of Major Petitions and study abroad planning forms). Students must see the undergraduate advisor for any forms requiring a department signature. We encourage any prospective and current language studies majors to stop by during the peer advisors' office hours if they have questions about the program.

Faculty

You should feel free to meet with any faculty member for advising, but it may make sense to speak with the undergraduate advisor first, to find out which faculty member might be best placed to advise you about your interests or concerns. You can find the current office hours for all faculty members in the faculty directory. For issues specifically related to the undergraduate program, you can turn to the Undergraduate Program director.

Getting Started in the Major

Here are a few tips to keep in mind when embarking on your major in language studies:

- Meet with a peer advisor to create your academic plan and get questions answered about your major.
- Determine how many language courses you need and begin any necessary language instruction as soon as possible. Visit the Languages and Applied Linguistics Department to find out about language placement, articulation and course offerings. Many language placement exams take place just before classes start in September.
- Prospective students should declare the major as early as possible so that they can complete the language, linguistics, and context requirements within the allowed period of enrollment. Major requirements are specified in the Requirements and Planners section of this statement.
- Students who wish to include a study abroad experience in their course of study will have to coordinate their choice of time abroad with the scheduling of UC Santa Cruz courses. Transfer students who have not made significant progress with the language requirements before entering UC Santa Cruz may find it difficult to include a time abroad before completion of graduation requirements.
- Plan to complete the bulk of your general education requirements early on. The sophomore, junior, and senior years can fill up quickly with major requirements (especially if you are planning to study abroad). Also, as general education courses are often lower-division courses, it can be frustrating to have to take them in the final quarters of your career, when you would like to take more advanced courses.

Program Learning Outcomes

The program learning outcomes for this major are the following:

1. **Analytical Thinking**
Students will formulate testable hypotheses, and present them clearly and completely. Students will accurately and insightfully use relevant evidence to evaluate hypotheses and determine routes for future investigation.
2. **Writing**
Students will formulate well-organized written arguments. At the micro-level, sentences will be grammatical, follow appropriate conventions, and strike an appropriate balance of clarity and complexity. At the macro-level, sentences will be linked together into paragraphs, and paragraphs into logical sections of a larger document.
3. **Properties of Language**
Students will apply analytical techniques to identify general properties of language, including but not limited to sound structure, word structure, sentence structure, meaning, use, and language processing. Students will explain the significance of relevant universal properties in some domain.
4. **Linguistics Theory and Investigation**
Students will demonstrate an active command of linguistic theory and linguistic investigation in at least one area of linguistic theory, including but not limited to morphology, phonetics, phonology, pragmatics, psycholinguistics, syntax, and semantics.
5. **Second Language Proficiency**
Students will demonstrate proficiency in a second language at an advanced level.

Major Qualification Policy and Declaration Process

Major Qualification

The Linguistics Department has adopted a major qualification policy for language studies majors that is intended to encourage students to take their performance in the gateway courses seriously and to help them lay a solid foundation for further coursework in the major.

Transfer students, please also refer to **Transfer Information and Policy**

In order to declare the language studies major, a student must pass two gateway courses with a grade of C+ or better in each:

LING 50	Introduction to Linguistics	5
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And one of the following courses:

LING 53	Semantics I	5
LING 101	Phonology I	5

LING 112	Syntax I	5
LING 171	Psycholinguistics I	5

Appeal Process

Students who are informed that they are not eligible to declare the major may appeal the decision within 15 days from the date the notification was mailed. They should do this by submitting a formal letter, addressed to the department's undergraduate program director, to the Linguistics Department office (Stevenson 241 or 243). This letter should explain any extenuating circumstances that influenced performance in the gateway courses. Within 15 days of receipt of the appeal, the department will notify the student of the decision.

How to Declare a Major

You should formally declare your major as early as possible in your academic career. Doing so will mean you get helpful advising. It will require you to plan out all the courses of the major. This means you will know you have time to meet all the necessary requirements for language studies before you graduate.

Once you have successfully completed the two gateway courses, please meet with the department advisor or a peer advisor, to complete or update your academic plan. If you are declaring a second major, please first complete an Academic Planning Form with the advisor for your declared major.

To declare the major, you must attend one of the department's Declaration and Orientation Meetings. These sessions are held in the first month of each quarter. Invitations to sign up for a declaration session are sent out by the first week of the quarter to all proposed majors through the Slug Success system. If you have completed the gateway courses, and you do not receive an invitation by Week 2, please contact the department advisor for assistance. Please sign up well in advance, as these meetings tend to fill quickly.

The campus undergraduate advising website has further helpful information about declaring a major.

Transfer Information and Policy

Transfer Admission Screening Policy

No major preparation courses are required prior to transfer for consideration of admission to UC Santa Cruz.

While not required for selection, transfer students are strongly encouraged to complete as much preparation as possible in the foreign language of their choosing. Students pursuing the concentration in Japanese or Chinese should place into Level 4 (Level 5 for students entering in the winter term) or higher when they enter UC Santa Cruz, if they wish to complete the major in two years. Students in other languages may be able to complete the major in two years if they have completed general education requirements. Transfer students admitted to UC Santa Cruz for the winter term who do not place into Level 2 or higher in a language

placement test when they enter UC Santa Cruz may not be able to complete the major in a timely manner.

Prospective students are also encouraged to complete the Intersegmental General Education Transfer Curriculum (IGETC) or to complete all UC Santa Cruz general education requirements before matriculation.

Getting Started at UC Santa Cruz as a Transfer Student

Consult with the undergraduate advisor before enrolling for your first term, to create a two-year plan. Some required courses are only offered once a year, and careful planning is essential. Plan to take LING 50 and LING 53 in your first quarter, along with a language course. Visit the Languages and Applied Linguistics Department to find out about language placement, articulation, and course offerings. Many language placement exams take place just before classes start in September. Transfer students can declare the major in their second quarter, after completing two gateway courses with a C+ or better.

Letter Grade Policy

The two qualifying courses for the major must be completed with a grade of C+ or better. Once you qualify, there is no requirement that courses for the major be taken for a letter grade. There is a campuswide requirement that you need to be aware of and to keep track of (no more than 25 percent of all of your UC Santa Cruz courses can be taken on a Pass/No Pass basis). Further information about campus letter grade policy is available at the website of the Office of the Registrar.

Course Substitution Policy

Students may petition the department to have elective courses offered through other institutions or other UC programs applied toward the major requirements. At most three such courses can be applied toward the major. These courses must be upper-division and clearly fit into a coherent program of study. Because language studies majors routinely take classes from other UC Santa Cruz departments to fulfill their cultural context requirements, these are not considered course substitutions. However, students may substitute an outside class for one of the two required upper-division linguistics electives. A list of these approved outside courses from other UC Santa Cruz departments is available below.

Outside Courses

ANTH 139	Language and Culture	5
APLX 101	Second-Language Acquisition	5
APLX 102	Bilingualism	5
APLX 112	Language and Gender	5
APLX 113	Inter-Cultural Communication	5
APLX 115	Language and Power	5
APLX 116	Discourse Analysis: Language Use and Context	5

APLX 122	Linguistic Diversity & Social Justice	5	lengthening time to degree. Before being approved for the UC Education Abroad Program (EAP), you must declare your major. Also, majors must complete LING 101, and either LING 111 or LING 112, before they leave for any EAP programs during the academic year. The department does not place any restrictions on summer study abroad.
APLX 124	Second Language Variation and Sociolinguistics	5	
APLX 135	Second Language Teaching	5	
APLX 138	English Grammar for TESOL	5	
CSE 103	Computational Models	5	
CSE 110A	Fundamentals of Compiler Design I	5	
CSE 140	Artificial Intelligence	5	
CSE 143	Introduction to Natural Language Processing	5	
CSE 245	Computational Models of Discourse and Dialogue	5	
FREN 114	French Phonetics	5	
FREN 120	French Linguistics	5	
FREN 121	History of the French Language	5	
LIT 102	Translation Theory	5	
PHIL 117	Non-Classical Logic	5	
PHIL 119	Intermediate Logic	5	
PHIL 123	Philosophy of Language	5	
PSYC 125	The Psychology of Language	5	
SPAN 140	Sounds of Spanish	5	If you plan to study abroad during your senior year, and do not plan to return to UC Santa Cruz before graduating, your plan will be approved only when all major requirements have been completed prior to departure, and/or when it is clear that any remaining requirements can be satisfactorily completed abroad. Please consult with the department advisor before the end of your sophomore year if you are considering this option.
SPAN 150	Topics in Hispanic Linguistics: Introduction to Hispanic Linguistics	5	
SPAN 151	Topics in Hispanic Linguistics: Varieties of Spanish	5	
SPAN 152	Topics in Hispanic Linguistics: Spanish in the U.S.	5	
SPAN 153	Topics in Hispanic Linguistics: Spanish as a Second Language	5	
			Language studies majors can satisfy certain major requirements in the course of study abroad; for instance, some of the context elective course requirements. No more than three elective course requirements can be satisfied abroad. Students can also make progress in the language component of the language studies major while studying abroad. In order to determine the level of proficiency achieved, they must take a placement exam upon return. Whether a given course requirement in linguistics can be satisfied abroad depends on the course and the study site.
			Most importantly: Students who wish to have a study-abroad course count toward the major must bring back syllabi, completed papers, and course evaluations to the department, so that the department can make a decision about whether the course satisfies a major requirement. Ideally, students should have courses pre-approved for the major before they go abroad. Students can visit the UCSC Campus Credit Abroad database to find pre-approved courses. Remember that a maximum of three outside courses may be used toward the major.
			Students who are interested in studying abroad should contact the Global Learning Office (105 Classroom Unit, 459-2858). Global Learning staff can provide detailed information concerning EAP selection criteria and application procedures. The first step in preparing to study abroad is to set up a profile on the Global Learning website.

Double Majors and Major/Minor Combinations Policy

A student may **not** double major or major/minor in linguistics and language studies, as there is too much overlap between the two programs.

Study Abroad

Students majoring in language studies often spend at least one quarter studying abroad in the course of their degree program. Studying abroad is a good way to cultivate and enhance your language skills, as well as to gain rich life experiences. There are programs available for students of all levels of language ability, from language and culture programs for beginning or intermediate speakers, to full immersion programs for students with advanced language skills.

Study abroad does require careful planning, especially for those who wish to pursue a yearlong program, or who wish to study abroad during the senior year. Meeting with your major advisor early and often throughout the Study Abroad planning process will help to mitigate

Honors

Students who wish to be considered for honors should meet the deadline posted by the Office of the Registrar for declaring the intent to graduate. It is important to minimize the number of major courses you take on a Pass/No Pass basis. Determination of honors is based on the student's grades for all courses relevant to the major and other factors relevant to an assessment of academic excellence, such as research papers of professional quality. Generally, honors in the major are awarded only to the top 10 percent of those graduating in the major. Only those students whose performance in coursework is excellent will qualify. Highest honors are rarely awarded, and then only to students whose performance in coursework is outstanding and who have completed an outstanding senior thesis.

Preparation for the UC Santa Cruz Master's Degree

Every year, UC Santa Cruz undergraduates in the final year of their language studies major can apply to be admitted into the graduate program to pursue the M.A. in theoretical linguistics. Interested students should discuss the possibility with one or more faculty members and formally apply online to the graduate program during the fall quarter of the senior year. For up-to-date information about the application process, consult the Linguistics Department's website; and see the graduate coordinator. The combined B.A./M.A. program provides another pathway to the M.A. program.

Information About Linguistics Courses

The 80-level courses have no prerequisites. Although most will fulfill a general education requirement, they do not fulfill any requirements for the major. They are intended to introduce the concepts of linguistics through their relation to other areas of general interest.

LING 50, Introduction to Linguistics, introduces the subfields of the discipline. LING 53, Semantics I; LING 100, Phonetics I; LING 101, Phonology I; LING 112, Syntax I; and LING 171, Psycholinguistics I, serve as entry courses to the specialized upper-division sequences. Upper-division courses generally have at least two of these courses as prerequisites.

A variety of upper-division elective courses are offered each quarter. For a list of the current offerings, please see the department website.

To enroll in the graduate (200-level) courses, undergraduates need special permission from the instructor. Permission is usually granted only to especially motivated undergraduates who have completed all the named requirements for the major with excellent performance.

Requirements and Planners

Course Requirements

Language studies majors must satisfy course requirements in languages and linguistics, and complete elective coursework in linguistics and/or the cultural context of the language of concentration.

Lower-Division

Lower-Division Language Requirements

Language studies majors must achieve a level equivalent to six quarters in the language of concentration.

Lower-Division Linguistics Requirements

LING 50	Introduction to Linguistics	5
LING 53	Semantics I	5

Upper-Division

Upper-Division Language Requirements

One advanced language course after level 6 is required for students concentrating in French, German, Italian, or Spanish. Majors in Chinese and Japanese must take two advanced language courses after level 6, the second of which (and any subsequent) counts toward the cultural context course requirement.

Upper-Division Linguistics Requirements

LING 100	Phonetics I	5
LING 101	Phonology I	5

One of the following upper-division courses:

LING 111	Syntactic Structures	5
LING 112	Syntax I	5

Plus one additional upper-division linguistics elective:

This upper-division linguistics elective may serve as the capstone course for students completing Option 1 (Capstone Course) for the major's senior exit requirement. Capstone electives for the language studies major will be offered every quarter during the academic year, in conjunction with LING 190, Senior Research. Please see the Comprehensive Requirement section below.

Electives

The major also requires five upper-division elective courses in linguistics or the cultural context of the language of concentration. Linguistics elective courses include any upper-division course offered by the Linguistics Department (except LING 100, LING 101, LING 111, and LING 112). Cultural context courses are to be selected from among those approved by the department, and include disciplines such as literature, history, and politics. A list of approved cultural context courses (p. 200) is available, and a list of those available within the current or upcoming quarters is also available on the Linguistics Department's Language Studies Major Requirements webpage. Further upper-division courses conducted in the language of concentration may also be used as electives.

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division disciplinary communication (DC) requirement. The DC requirement in language studies is satisfied by completing:

LING 101	Phonology I	5
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Plus one of the following courses:

LING 111	Syntactic Structures	5
LING 112	Syntax I	5

Comprehensive Requirement

Senior exit requirement. In their senior year, language studies majors must satisfy the senior exit requirement in one of three ways:

Option 1

Capstone course: Students complete a 2-credit senior research course, LING 190. Each instance of LING 190 is taught concurrently with one of the upper-division linguistics electives offered in that quarter. Students must enroll in **both** an instance of LING 190 and its associated upper-division elective. This elective can also serve as the one linguistics elective required for the major.

Students must enroll **concurrently** in an upper-division elective and in the corresponding instance of the following course:

LING 190	Senior Research	2
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Option 2

Senior thesis supervised by a faculty member. The proposal for a senior thesis must be submitted for the approval of the department faculty at least three quarters prior to the quarter of graduation. The senior thesis is an original investigation of the major language in some relevant way, such as the linguistic structure or history of the language or its historical, literary, cultural, sociological, ethnographic, or political context.

Students may enroll in the following course:

LING 195	Senior Thesis	5
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Option 3

By exception, students in their senior year may enroll in a **graduate-level linguistics class**, by permission of instructor. This option is for students who have performed exceptionally in the available undergraduate courses in a particular sub-discipline of the field. Under these conditions, a graduate-level course may satisfy the senior exit requirement.

Planners

Four-Year Students

The following is a recommended academic plan for four-year students who wish to pursue the language studies major.

	Fall	Winter	Spring
1st(frosh)	College 1 LING 50		WRIT 2
2nd (soph)	LING 53 Foreign language level 1	LING 100 Foreign language level 2	LING 101 Foreign language level 3

3rd (junior)	Context 1XX upper-division elective	LING 112	Context 1XX upper-division elective
	Foreign language level 4	Foreign language level 5	Foreign language level 6
4th (senior)			LING 1XX capstone course
	Context 1XX upper-division elective	Context 1XX upper-division elective	LING 190*
	Foreign language 1XX upper-division language	Context 1XX upper-division elective	

*This is a 2-credit course.

The second upper-division foreign language course is required only for students with a concentration in Chinese or Japanese. In addition to the specific courses shown in these planners, a student must complete courses satisfying the general education requirements. The courses in the four-year planner cover at least the following general education requirements: C, CC, MF, SI.

Junior Transfer Students, Language Studies

The following is a recommended academic plan for junior transfer students who wish to pursue the language studies major.

	Fall	Winter	Spring
1st (junior)	LING 50 LING 53	LING 100 LING 112	LING 101 Context 1XX upper-division elective
	Foreign	Foreign	Foreign

	language level 4	language level 5	language level 6
2nd (senior)	Context 1XX upper-division elective	Context 1XX upper-division elective	LING 1XX capstone course
	Foreign language 1XX upper-division language	Context 1XX upper-division elective or Foreign language 1XX upper-division language	Context 1XX upper-division elective

*This is a 2-credit course.

Note: this major planner presumes that the student enters UC Santa Cruz having already completed three quarters of foreign language or having equivalent proficiency. The second upper-division foreign language course is required only for students with a concentration in Chinese or Japanese. This planner also assumes that a student has completed any required GE courses — including UC Santa Cruz or community college GE requirements— before coming to UCSC. This can be accomplished by completing the Intersegmental General Education Transfer Curriculum (IGETC).

Additional planning templates are available on the department website.

LANGUAGE STUDIES MINOR

Course Requirements

Lower-Division Courses

The minor requires completion of six quarters of language study, or demonstration of an equivalent level of ability, and the following:

LING 50	Introduction to Linguistics	5
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Upper-Division Courses

The upper-division requirements for the minor are comprised of two required linguistics courses, one advanced language course, and two electives, as follows:

Two linguistics courses:		
LING 100	Phonetics I	5
Plus one of the following courses:		
LING 111	Syntactic Structures	5
LING 112	Syntax I	5

One advanced language course after level 6.

Two upper-division electives in linguistics or in the cultural context of the language of concentration.

Linguistics elective courses include any upper-division course offered by the Linguistics Department (except LING 100, LING 111, and LING 112). Cultural context courses are to be selected from among those approved by the department, and include disciplines such as literature, history, and politics, subject to departmental approval. These cultural context courses are related to the language of concentration.

A master list of approved cultural context courses (p. 200) and a list of those available within the current or upcoming quarter are available via these links, as well as links on the Linguistics Department's Language Studies Major Requirements webpage.

Course Substitution Policy

Students may petition the department to have elective courses offered through other institutions or other UC programs applied toward the minor requirements. At most two such courses can be applied toward the minor. These courses must be upper-division and clearly fit into a coherent program of study. Because language studies minors routinely take classes from other UCSC departments to fulfill their cultural context requirements, these are not considered course substitutions. However, students may substitute an outside class for an upper-division linguistics elective. A list of approved outside courses being offered in the current or upcoming term may be found on the department website.

LINGUISTICS CONTIGUOUS BACHELOR/MASTERS PATHWAY

The B.A./M.A. pathway in linguistics is a demanding, selective option that allows students who are well prepared and well motivated to complete the requirements for both degrees in five years rather than the usual six.

Admission to the pathway has two stages. In the first stage, interested students first consult with the undergraduate program director and one or more faculty members, and then apply to be admitted to the pathway by the sixth week of the first quarter of their junior year. Transfer students should consult with the undergraduate program director if they are contemplating this pathway. In order to be accepted at this first stage, students must

have demonstrated excellence in at least three courses that are named requirements for the linguistics major.

Students accepted at this initial stage are assigned a faculty mentor who monitors their progress closely.

At the second stage of the admission procedure, students apply in their senior year to be admitted to the M.A. program through UCSC's normal graduate admissions process. If accepted, ideally they complete all course requirements and complete and defend the M.A. thesis by the end of the fifth year.

Students in the B.A./M.A. pathway take a number of graduate courses in their senior year which are selected in close consultation with the faculty mentor. Performance in these courses forms a central part of the ongoing evaluation process. If a student's performance does not meet the standards set for the pathway, the student completes the B.A. at the end of the senior year and does not proceed to the M.A.

Graduate courses required for the M.A. are taken partly in the senior year and partly in the fifth year. The M.A. thesis is written in the fifth year. Thus, by the end of the fifth year, students in the pathway will have fulfilled the requirements for both the B.A. and the M.A. degrees. Students who need additional time may remain in the pathway until the M.A. thesis is completed and defended. Students admitted into the B.A./M.A. pathway must complete a minimum of 35 credits as an M.A. student, regardless of the number of graduate courses completed as an undergraduate.

LINGUISTICS M.A.

Introduction

For information on applying and admissions, please consult the Linguistics Department website.

The M.A. degree involves a two-year course of study. It may be completed in one year by students who have a B.A. in linguistics from UC Santa Cruz and who have taken a number of the core graduate courses during their undergraduate career; [the combined B.A./M.A. program](#) provides another pathway to the M.A. program.

Every year, UC Santa Cruz undergraduates in the final year of their linguistics or language studies major can apply to be admitted into the graduate program to pursue the M.A. in theoretical linguistics. Interested students should discuss the possibility with one or more faculty members and formally apply online to the graduate program during the fall quarter of the senior year.

For up-to-date information about the application process, consult the Linguistics Department's website; and see the graduate coordinator.

Requirements

Course Requirements

The following courses must be taken by all

students.		
LING 211	Phonology A	5
LING 221	Syntax A	5
LING 231	Semantics A	5

All students are required to take two additional core courses drawn from the following list:

LING 212	Phonology B	5
LING 222	Syntax B	5
LING 232	Semantics B	5

Students must take the third core course from the above list of 'B' courses, or one course from the following list:

LING 214	Phonetics	5
LING 257	Psycholinguistics and Linguistic Theory	5
LING 280	Proseminar in Experimental Linguistics	5
LING 282	Field Methods	5

Electives

Additionally students must take **three electives** that form a coherent plan of study, as determined by the student's advisor in consultation with the student. These electives are typically drawn from graduate courses offered by Linguistics and other related disciplines and independent study courses with Linguistics faculty.

Other Requirements

Foreign Language Requirements

Reading competence in one foreign language, to be demonstrated by examination at the end of your first year.

Course Credit Requirement

The nine required courses must be taken as 5-credit courses. For any of the courses above, satisfactory completion (grade of P or A- or higher) prior to entry to the M.A. program will count toward course requirements for the M.A. degree. Pursuant to UC Santa Cruz Graduate Division policy, students must complete a minimum of 35 credits within the Linguistics Department graduate curriculum as an M.A. student.

Master's Thesis

Students in the master's program complete a master's thesis in linguistics. This thesis often grows out of a promising term paper written by the student, and is read by a committee composed of three faculty members in linguistics. Preparation for research projects should begin far in advance. In general, a good goal for those working on their M.A. thesis is to approach a possible thesis chair by the end of their first academic year.

Applying for Graduation

See the Graduate Student Handbook for administrative requirements.

See the Academic and Administrative Calendar for Announcement of Candidacy dates.

Note: The completed master's thesis, and cover sheet, should be submitted to the Graduate Division and a pdf copy of the thesis, and cover sheet, should be submitted to the graduate coordinator.

LINGUISTICS PH.D.

Introduction

The graduate program in linguistics at UCSC is a small, focused program in linguistic theory leading to Doctor of Philosophy (Ph.D.) or Master of Arts (M.A.) degrees. The research interests of faculty and students draw mostly on the framework of generative grammar, with a primary focus on theoretical and experimental approaches to morphology, phonetics, phonology, pragmatics, psycholinguistics, semantics, and syntax. Research strengths also include the study of various languages, computational methods, and field methods.

While committed to training in theoretical depth, the program makes possible an unusual breadth of theoretical and experimental understanding. Research in syntax focuses on ways in which generative theory and language-particular analysis inform one another. Faculty expertise covers principles and parameters theory, minimalism, and experimental syntax. Research in phonetics and phonology is pursued in various current frameworks, including optimality theory and dispersion theory. The issues covered range from phonetics and the phonetics-phonology interface to prosodic theory, prosodic morphology, and the syntax-phonology interface. Research in semantics applies formal, model-theoretic techniques to illuminate the interface between syntactic structure and interpretation and the role of semantic competence in the pragmatics of utterance interpretation. Experimental research in these areas reaches out to a broad range of issues in psycholinguistics and cognitive science.

The faculty have expertise in a diverse range of languages, including Chamorro, German, Hebrew, Hindi, Hungarian, Irish, Japanese, Kaqchikel Mayan, Uspanteko Mayan, Latin, Northern Paiute, Persian, Polish, Romanian, Russian, Spanish, Turkish, and Zapotec.

From the beginning of their studies, students are engaged in original research and critical evaluation, since the program aims to provide sophisticated training as a foundation for a career in academic research and teaching. The program begins with a sequence of foundation courses in phonetics, phonology, syntax, semantics, and psycholinguistics, addressing both formal and experimental approaches. Subsequent coursework emphasizes depth; it is increasingly centered around the doctoral student's independent research, culminating in the completion of a dissertation.

For information on applying and admissions, please consult the Linguistics Department website.

Undergraduate Preparation

Applications are invited from students who have completed an undergraduate linguistics major or who have demonstrated excellence in some related discipline (psychology, mathematics, computer science, anthropology) and have the equivalent of a minor in linguistics. A student applying for admission to this program should, at a minimum, have a good foundation in at least one of the following: phonetics, phonology, psycholinguistics, morphology, semantics, or syntax. Students entering the program with a deficiency in one or more areas may need to take appropriate undergraduate courses at UCSC during the first year of graduate study.

To apply, please consult the Linguistics Department website.

Advancement to Candidacy

Course Requirements

A minimum of 65 credits of graduate-level work.

All students are required to take the following eight core courses:

LING 211	Phonology A	5
LING 212	Phonology B	5
LING 214	Phonetics	5
LING 221	Syntax A	5
LING 222	Syntax B	5
LING 231	Semantics A	5
LING 232	Semantics B	5
LING 257	Psycholinguistics and Linguistic Theory	5

Plus one of the following courses:

LING 280	Proseminar in Experimental Linguistics	5
LING 282	Field Methods	5

Each student must also take four seminars.

One of these must be LING 290 (Research Seminar) and the remaining three seminars or proseminars must form a coherent program of study, as determined by the student's adviser in consultation with the student.

The 13 required courses must be taken as 5-credit courses.

Foreign Language Requirements

Reading competence in one foreign language, to be demonstrated by examination at the end of the first year of study.

Teaching Requirement

Pre-Qualifying Requirements

Two qualifying papers (QP), each in a distinct area, must be separately and orally defended by the end of the third

year as part of the requirements for advancement to candidacy.

Qualifying Examination

After a student successfully defends the two qualifying papers, they proceed to prepare for the qualifying exam (QE) in order to advance to candidacy. The function of the qualifying exam is to determine whether the student has achieved sufficient competence in a chosen subfield to be able to proceed to dissertation research. The QE is based on a substantial research paper written by the student and presented to the committee at least two weeks in advance of the exam. The topic of this paper is decided by the QE chair in consultation with the student. In most cases, it will be a revised version of one of the QPs that the student has successfully defended. Whether or not the paper originated as a QP, it must be in the subfield in which the student plans to pursue dissertation research.

Post-Qualifying Requirements

Dissertation Prospectus

The dissertation prospectus lays out the direction of research that the student plans to pursue in the dissertation. It relates the student's planned research to previous relevant research and to the larger questions with which the field is engaged. This milestone can be satisfied by the QE paper at the discretion of the faculty adviser.

[Optional Catchall]

Dissertation

Dissertation

The final requirement for the Ph.D. degree is the completion of a dissertation representing a significant contribution in some central area of linguistic research.

Dissertation Defense

Once a student has completed the dissertation, they defend it at a public dissertation defense that is generally attended by graduate students and faculty in linguistics. The candidate first presents the results of the dissertation and then responds to questions, first from committee members, and then, time permitting, from the audience. Afterwards, the committee confers privately and decides either to accept the dissertation, reject it, or accept it provisionally, pending specific revisions. Following the defense, the candidate will revise the dissertation according to the committee's recommendations and then submit the final copy to the Graduate Division and graduate coordinator. See the Graduate Handbook for administrative requirements.

A copy of the completed dissertation, formatted according to UC Santa Cruz specifications, should be electronically submitted to the Graduate Division office (see Dissertation and Thesis Submission Guidelines) and an original, signed cover sheet should be submitted to the Graduate Division office as well. In addition, a pdf copy

of the dissertation and physical copy of the cover sheet should be submitted to the graduate coordinator.

Academic Progress

The Linguistics Department faculty meet at the end of spring quarter each year to ensure that all graduate students are making timely progress in the program. Students may receive letters from the faculty based on this discussion.

To remain in good academic standing, a student must make timely progress toward degree completion and satisfactorily meet the following standards of scholarship established by the Graduate Council. Please see the Graduate Division handbook for details about 'Academic Good Standing' and 'Time to Degree.'

Applying for Graduation

See the Graduate Handbook for administrative requirements.

See the Academic and Administrative Calendar for Announcement of Candidacy dates.

NOTE: The completed dissertation, and cover sheet, should be submitted to the Graduate Division and a pdf copy of the dissertation, and cover sheet, should be submitted to the graduate coordinator.

[Optional Catchall]

LANGUAGE STUDIES CULTURAL CONTEXT ELECTIVES COURSE LIST

Cultural Context Electives

Cultural Context Electives

Chinese Language Concentration Electives

ANTH 130C	Politics and Culture in China	5
ANTH 130G	Asian Americans in Ethnography and Film	5
CHIN 103	Advanced Chinese: Language and Society	5
CHIN 104	Advanced Chinese: Readings in Literature	5
CHIN 105	Advanced Chinese: Readings in History	5
CHIN 107	Introduction to Classical Chinese Prose	5
CHIN 108	Introduction to Classical Chinese Poetry	5
ECON 149	The Economies of East and Southeast Asia	5
EDUC 170	East Asian Schooling and Immigration	5
FILM 165D	Asian Americans and Media	5

HAVC 122A	Sacred Geography of China	5	POLI 161	The Rise of China	5
HAVC 122B	Constructing Lives in China: Biographies and Portraits	5	THEA 100A	Asian Theater/Dance and Global Impacts	5
HAVC 122C	Writing in China	5	French Language Concentration Electives		
HAVC 122D	Chinese Landscape Painting	5	ANTH 110O	Postcolonial Britain and France	5
HAVC 122F	Bodies in Chinese Culture	5	FREN 108	French Cinema	5
HAVC 127A	Buddhist Visual Worlds	5	FREN 111	Stylistics	5
HAVC 127B	Buddhist Pure Lands	5	FREN 114	French Phonetics	5
HAVC 127C	Ritual in Asian Religious Art	5	FREN 120	French Linguistics	5
HAVC 127D	Storytelling in Asian Art	5	FREN 121	History of the French Language	5
HAVC 127F	The Politics of Exclusion: Asian American Visual Culture	5	FREN 125A	French Civilization: 19th Century	5
HIS 106B	Asian and Asian American History, 1941-Present	5	FREN 125B	French Civilization: 20th Century	5
HIS 140B	History of Qing China, 1644-1911	5	FREN 130	French for Professions	5
HIS 140C	Revolutionary China 1895-1960	5	FREN 131	Social Activism in France: The Tradition of Chanson Française Engagée	5
HIS 140D	Recent Chinese History	5	FREN 136	La Francophonie	5
HIS 140E	Women in China's Long 20th Century	5	HAVC 135D	French Painting, 1780-1855	5
HIS 194J	The Poor and the Everyday in Modern China	5	HAVC 135P	Paris, Capital of the 19th Century	5
HIS 194M	Literati, Samurai, and Yangban: Comparative History of State and Elite in East Asia, 1600-1900	5	HAVC 190P	Death and Patriotism: The Case of the French Revolution	5
HIS 194Z	Historical Memory and Historical Narration in China	5	HIS 170A	French History: Old Regime and Revolution	5
LIT 133E	Contemporary Chinese Society, Culture, and Politics	5	HIS 170B	French History: The 19th Century	5
LIT 141B	Classical Chinese Culture and Literature, 10th Century B.C.E. through Sixth Century C.E	5	HIS 170C	From the Trenches to the Casbah: France and its Empire in the 20th Century	5
LIT 141C	Classical Chinese Culture and Literature, Sixth Century through 16th Century	5	LIT 125C	Great French Novels	5
LIT 162A	Asian American Literature	5	LIT 125J	French Science Fiction	5
LIT 162B	Literature of the Asian Diaspora	5	LIT 137C	Imagining Paris	5
LIT 162C	So Many Little Lives: Representations of Trauma in Asian American Literature	5	LIT 182A	Le Moyen Age	5
LIT 167H	Disability in Transnational Asian American Studies	5	LIT 182E	Etudes de Poésie	5
POLI 140D	Politics of East Asia	5	LIT 182F	Le théâtre	5
POLI 141	Politics of China	5	LIT 182H	Auteur et culture	5
			LIT 182I	Littérature d'expression française hors de France	5
			LIT 182J	Theorie	5
			LIT 182K	Textes et contextes	5
			LIT 182L	Science-Fiction Française	5
			PHIL 108	Phenomenology	5
			German Language Concentration Electives		
			GERM 119	German Media	5
			GERM 120	Advanced German Conversation and Composition	5
			HAVC 135B	German Art, 1905-1945	5
			HIS 172A	German History	5
			HIS 172B	German Film, 1919-1945	5
			HIS 172C	History of German Film, 1945 to Present	5

HIS 196G	Topics in Modern Germany and Europe	5	LIT 185B	Letteratura e cultura italiana	5
LIT 112I	Kafka in Translation	5	LIT 185H	L'Opera italiana	5
LIT 114D	Goethe's Faust	5	LIT 185I	Teatro italiano	5
LIT 125D	Modern German Fiction	5	LIT 185J	Poesia moderna	5
LIT 132A	Germany in War and Peace	5	LIT 185L	La novella italiana	5
LIT 149A	Behind the Berlin Wall	5	LIT 185M	Fascismo e resistenza	5
LIT 155C	New German Cinema	5	LIT 185N	Le donne nell'Italia moderna	5
LIT 164G	Literature and the Holocaust	5	LIT 185P	Boccaccio: Decameron	5
LIT 183A	Einführung in der deutschen Literatur	5	LIT 185Q	Dante: Divina Commedia	5
LIT 183B	Themen in deutscher Literatur und Kultur	5	Japanese Language Concentration Electives		
LIT 183D	Die deutsche Romantik	5	ANTH 130G	Asian Americans in Ethnography and Film	5
LIT 183F	Die deutsche Novelle	5	CRES 112	AsianAm Enviro Justice	5
LIT 183G	Deutsche Komödie	5	CRES 116	Race and the Pacific: U.S. and Japanese Empires in Comparative Perspective	5
LIT 183H	Das deutsche Drama	5	ECON 149	The Economies of East and Southeast Asia	5
LIT 183I	Deutscher Film: Geschichte, Kultur, Gesellschaft	5	EDUC 170	East Asian Schooling and Immigration	5
LIT 183K	Moderne deutsche Literatur und Film	5	FILM 165D	Asian Americans and Media	5
LIT 183M	Moderne deutsche Fiktion	5	HAVC 127A	Buddhist Visual Worlds	5
LIT 183N	Modern Deutsche Lyrik	5	HAVC 127C	Ritual in Asian Religious Art	5
LIT 183P	Fremdenangst: Ausländerfeindlichkeit in der deutschen Literatur und Kultur	5	HAVC 127D	Storytelling in Asian Art	5
LIT 190Z	Topics in German Literature and Culture	5	HAVC 127E	Modern/Contemporary Architecture of the Asia Pacific	5
Italian Language Concentration Electives			HAVC 127F	The Politics of Exclusion: Asian American Visual Culture	5
HAVC 157B	Italian Renaissance: Art and Architecture	5	HIS 106B	Asian and Asian American History, 1941-Present	5
HAVC 157C	High Renaissance	5	HIS 150A	Emperors and Outcasts: Ancient Japan	5
HAVC 157D	Art of the Venetian Renaissance	5	HIS 150B	Tokugawa Japan	5
HIS 164A	Late-Medieval Italy, c. 1200-1400	5	HIS 150C	Inventing Modern Japan: The State and the People	5
HIS 164B	Renaissance Italy, c. 1400-1600	5	HIS 150D	The Japanese Empire, 1868-1945	5
HIS 183A	Nineteenth-Century Italy	5	HIS 150E	History and Memory in the Okinawan Islands	5
HIS 183B	Fascism and Resistance in Italy	5	HIS 150F	Engendering Empires: Women in Modern Japan and Korea	5
HIS 196C	Modern Italian Culture	5	HIS 194B	Okinawan History	5
HIS 196D	City of Rome	5	HIS 194E	Women in Japanese History	5
ITAL 100	Advanced Italian Composition and Conversation	5	HIS 194M	Literati, Samurai, and Yangban: Comparative History of State and Elite in East Asia, 1600-1900	5
ITAL 106	Italian Culture Through Film	5	HIS 194Y	Memories of WWII in the U.S. and Japan	5
LIT 114C	Dante's Divine Comedy	5	JAPN 103	Advanced Japanese	5
LIT 114E	One Way Ticket to Hell ... and Back: Exploring Dante's Inferno	5	JAPN 104	Advanced Japanese	5
LIT 114F	Finding Dante: A Reader's Guide to Getting Out of Hell	5	JAPN 105	Advanced Japanese	5
LIT 155D	Italian Cinema and Literature	5			
LIT 166C	Early Modern Italian Women Writers	5			

JAPN 109	Japanese Language, Culture, and Society	5	HAVC 162B	Advanced Studies in Early Indigenous American Visual Culture: The Inka	5
LIT 133I	Global Japan: Literatures of the Japanese Diaspora	5	HAVC 163	The Native in Colonial Spanish America	5
LIT 160I	Race, Militarism, and Empire in Asia and the Pacific	5	HAVC 165	Indigenous Artists and the Borderland Missions	5
LIT 162A	Asian American Literature	5	HAVC 190T	Topics in Pre- and Post-Columbian Visual Culture	5
LIT 162B	Literature of the Asian Diaspora	5	HAVC 191B	The Virgin of Guadalupe: Images and Symbolism in Spain, Mexico, and the U.S	5
LIT 162C	So Many Little Lives: Representations of Trauma in Asian American Literature	5	HIS 124A	Panama Canal and U.S. Empire	5
LIT 167H	Disability in Transnational Asian American Studies	5	HIS 128	Chicana/Chicano History	5
POLI 140D	Politics of East Asia	5	HIS 130	History of Modern Cuba	5
THEA 100A	Asian Theater/Dance and Global Impacts	5	HIS 131	Women in Colonial Latin America	5
THEA 161D	Asian Theater: An Anthropological Approach	5	HIS 134A	Colonial Mexico	5
			HIS 134B	History of Mexico, 1850 to Present	5
			HIS 185I	Latin American Jewish History in the Modern Period	5
Spanish Language Concentration Electives			HIS 185L	Where Civilizations Met-- Jews, Judaism, and the Iberian Peninsula	5
ANTH 130J	Politics and Statemaking in Latin America	5	HIS 190A	Slavery and Race in Latin America	5
ANTH 130L	Ethnographies of Latin America	5	HIS 190B	Race and the Nation in Latin America	5
ANTH 130M	Inside Mexico	5	HIS 190D	Asian and Latino Immigration Since 1875	5
ANTH 130P	Ethnography of Southern Cone Chile and Argentina	5	HIS 190T	Latin America in the Cold War	5
ANTH 130U	Central America	5	LALS 100	Concepts and Theories in Latin American and Latina/o Studies	5
ANTH 176B	Meso-American Archaeology	5	LALS 100A	Social Science Analytics	5
ANTH 176D	Colonial Encounters in the Americas	5	LALS 100B	Cultural Theory in the Americas	5
ECON 148	Latin American Economies	5	LALS 112	Immigration and Assimilation	5
ENVS 154	Amazonian Cultures and Conservation	5	LALS 115	Mexico-United States Migration	5
FILM 165E	Chicana/o Cinema, Video	5	LALS 122	Media and Nationalism	5
FMST 115	Gender, Sexuality, and Transnational Migration Across the Americas	5	LALS 127	Genero, Nacion Y Modernidad En El Cine	5
FMST 124	Technology, Science, and Race Across the Americas	5	LALS 128	Latino Media in the U.S	5
FMST 175	Gender and Sexualities in Latina/o America	5	LALS 129	America Latina: Cine, Dictadura y Memoria	5
HAVC 140D	Chicano/Chicana Art: 1970-Present	5	LALS 130	Expresiones cuirs de Genero y Sexualidad en el cine Latinoamericano	5
HAVC 143C	Latin American Modern Architecture	5	LALS 131	Latino Literatures: Assimilation and Assimilability	5
HAVC 144A	Latin American Art and Visual Culture	5	LALS 133	Latina/o Art and Representation	5
HAVC 160A	Indigenous American Visual Culture Before 1550: Mexico	5	LALS 135	El Salvador: Expresiones Culturales	5
HAVC 160B	Indigenous American Visual Culture Before 1550: The Andes	5	LALS 143	Race and Ethnicity	5
HAVC 162A	Advanced Studies in Early Indigenous American Visual Culture: The Ancient Maya	5	LALS 144	Mexicana/Chicana Histories	5

LALS 145	Grassroots Social Change in Latin America	5	LIT 188H	Erotismo y Mistica	5
LALS 149	Whiteness in Latin America	5	LIT 188I	La novela picaresca	5
LALS 150	Afro-Latinos/as: Social, Cultural, and Political Dimensions	5	LIT 189A	De la conquista a Sor Juana	5
LALS 152	Consumer Cultures Between the Americas	5	LIT 189B	El Siglo XIX en America Latina: cultura, política y sociedad	5
LALS 155	Latin American and Latino Youth Movements	5	LIT 189C	Introducción a Spanish Studies	5
LALS 156	Human Rights and Transitional Justice in the Americas	5	LIT 189D	Sor Juana Ines de la Cruz	5
LALS 157	Revoluciones Sociales	5	LIT 189E	Cuba	5
LALS 158	Latin American Political Economy	5	LIT 189F	Literaturas Latinas en los Estados Unidos: en inglés, español y Spanglish	5
LALS 165	Contemporary Peru	5	LIT 189G	Cine y Literatura	5
LALS 168	Inter-American Relations	5	LIT 189H	La Globalizacion en/del Cine Latin/o Americano	5
LALS 169	South America: History, Society, and Culture	5	LIT 189I	Literatura e indigeneidad	5
LALS 170	Indigenous Struggles in the Americas	5	LIT 189K	El ensayo latinoamericano	5
LALS 172	Visualizing Human Rights	5	LIT 189L	Poesía latinoamericana	5
LALS 175	Migration, Gender, and Health	5	LIT 189M	Prosa contemporánea hispanoamericana	5
LALS 178	Gender, Transnationalism, and Globalization	5	LIT 189N	Latinoamericano testimonio	5
LALS 180	Borders: Real and Imagined	5	LIT 189O	El Cuento Hispanoamericano: Variedades esteticas de la literatura breve en America Latina	5
LALS 194A	Immigrant Storytelling	5	LIT 189P	Las mujeres en la literatura latinoamericana	5
LALS 194B	Global Migration and Displacement	5	LIT 189Q	Ficción y marginalidad	5
LALS 194G	Chile: Social and Political Change	5	LIT 189R	La Novela de la Dictadura	5
LALS 194H	Central America and the United States	5	LIT 189S	La cultura popular en la narrativa latinoamericana	5
LALS 194M	Twentieth-Century Revolutions	5	LIT 189T	Historia de la lectura y los lectores: Recepcion y consumo cultural en el mundo Latino Americano	5
LALS 194R	Violencia Cotidiana en las Americas	5	LIT 189U	Modernidad y literatura: El Boom de la novela latinoamericana	5
LIT 114B	Don Quixote de la Mancha	5	LIT 189V	Andean Indigenismo	5
LIT 149F	Contemporary Mexican Narrative	5	LIT 189X	Estudios mediaticos	5
LIT 155E	Cinema and Social Change in Latin America	5	LIT 189Z	Literatura de Chile	5
LIT 165A	Chicano/Mexicano Geographies	5	LIT 190X	Temas de la literatura y cultura espanolas y latinoamericanas	5
LIT 165B	Latino Fictions of the Americas	5	POLI 140C	Latin American Politics	5
LIT 165C	Mesoamerican Indigenous/Indigenista Literature	5	POLI 144	Andean Politics	5
LIT 188A	Literatura medieval	5	POLI 190V	States in the Global South	5
LIT 188B	Literatura peninsular: de los orígenes al siglo XVIII	5	SOCY 156	U.S. Latinx Identities: Centers and Margins	5
LIT 188E	Teatro del Siglo de Oro español	5	SOCY 177A	Latinos/as and the American Global City	5
LIT 188F	Cuentos del Siglo de Oro español	5	SPAN 114	Advanced Conversation and Composition	5
LIT 188G	Literaturay vida en Don Quijote y otros textos cervantinos	5	SPAN 140	Sounds of Spanish	5
			SPAN 141	Advanced Spanish Grammar	5
			SPAN 150	Topics in Hispanic Linguistics: Introduction to Hispanic Linguistics	5

SPAN 151	Topics in Hispanic Linguistics: Varieties of Spanish	5	Language Studies (p. 191)
SPAN 152	Topics in Hispanic Linguistics: Spanish in the U.S.	5	Latin American and Latino Studies (p. 663)
SPAN 153	Topics in Hispanic Linguistics: Spanish as a Second Language	5	Linguistics (p. 184)
SPAN 154	Topics in Hispanic Linguistics: Spanish Pragmatics	5	Philosophy (p. 222)
SPAN 156A	The Language of Latin America Cinema	5	Spanish Studies (p. 178)
SPAN 156E	Spanish Culture	5	The study of literature at UCSC is organized as an interdisciplinary field coordinated through a single Department of Literature, including modern and ancient literatures in the original language and in translation, literary theory, and creative writing. This structure fosters innovative and comparative approaches to literature among both faculty and students. Courses in the department encompass traditional literary history and interpretation, cross-cultural inquiry and current theoretical debates, and new media. The Literature Department also sponsors the Italian studies minor.
SPAN 156F	El Humor en Espanol	5	
SPAN 156J	Contemporary Central America	5	
SPAN 156K	Spanish Discourse Analysis	5	
SPAN 156M	Mexico and the Southwest	5	

Literature

303 Humanities 1
(831) 459-4778

<https://literature.ucsc.edu/>

PROGRAMS OFFERED

Literature B.A. (p. 206)

Literature Minor (p. 217)

Italian Studies Minor (p. 218)

Literature M.A. (p. 218)

Literature Ph.D. (p. 219)

Literature Designated Emphasis (p. 220)

OTHER PROGRAMS OF INTEREST

Classical Studies (p. 130)

Critical Race and Ethnic Studies (p. 102)

East Asian Studies (p. 134)

Feminist Studies (p. 111)

History (p. 121)

History of Art and Visual Culture (p. 47)

History of Consciousness (p. 167)

Jewish Studies (p. 136)

Languages and Applied Linguistics (p. 169)

UNDERGRADUATE PROGRAM

Literature majors learn to read, think, and write critically. These skills have wide applicability, and offer pathways into related disciplines such as history, philosophy, psychology, sociology, anthropology, politics, and the history of art and visual culture. Literature majors enter a variety of careers ranging from law and journalism to management, government, international studies, publishing, technical writing, and teaching at all levels. The literature major prepares students for careers in digital storytelling and electronic media; film, television, and video; theater and the visual arts; and many other fields.

The Literature Department faculty requires that all literature majors have basic proficiency in a second language. Proficiency in more than one language enhances understanding of any literature and culture. Graduate programs in literature and other humanities disciplines generally require competence in at least one language other than English.

GRADUATE PROGRAM

The graduate program in literature is relatively small, and students work closely with an internationally recognized faculty throughout their graduate careers. Graduate students are able to take advantage of a rich array of intellectual and cultural events, to participate in collaborative research clusters, and to attend lectures by scholars whose work is transforming the discipline. The goal of the program is to develop scholars who will be qualified to teach in departments of national and comparative literatures, cultural studies, ethnic studies, and interdisciplinary programs.

Graduate study in literature includes Ph.D. and free-standing M.A. programs. M.A. students typically take two years to complete the degree and are well prepared to continue in a doctoral program elsewhere. Normative time for the Ph.D. is seven years, and graduates go on to

teach at institutions of higher learning across the world. Ph.D. students are required to be able to read proficiently in at least two languages that are integral to their intellectual work, one of which may be English. Within these guidelines students create their own programs of study, with dissertations on a range of comparative, translanguing and interdisciplinary projects. (See list of recent titles.)

COURSES FOR NON-MAJORS

The Literature Department invites students from all disciplines to take courses in the LIT 60/LIT 61 and LIT 80/LIT 81 series.

LITERATURE B.A.

Information and Policies

Introduction

The Literature Department at UC Santa Cruz fosters innovative and comparative approaches to reading and interpretation in courses in a variety of languages that encompass traditional literary history, cross-cultural inquiry, current theoretical debates, and new media.

Literature majors learn to read, think, and write critically. These skills have wide applicability, and offer pathways into related disciplines such as history, philosophy, psychology, sociology, anthropology, politics, and the history of art and visual culture. Literature majors enter a variety of careers ranging from law and journalism to management, government, international studies, publishing, technical writing, and teaching at all levels. The literature major prepares students for careers in digital storytelling and electronic media; film, television, and video; theater and the visual arts; and many other fields.

The Literature Department faculty requires that all literature majors have basic proficiency in a second language. Proficiency in more than one language enhances understanding of any literature and culture. Graduate programs in literature and other humanities disciplines generally require competence in at least one language other than English.

Academic Advising for the Program

Faculty advisors are available in the Literature Department office throughout each academic term; students may make appointments in advance to meet with them. Staff advisors are available by appointment and on a drop-in basis. Students are encouraged to consult with an advisor once per quarter.

Transfer students should also consult the section Transfer Information and Policy.

Advisors for the literature program are available at litdept@ucsc.edu, (831) 459-4778, or by visiting the Literature Department office in Humanities 1, room 303.

Getting Started in the Major

All students considering a literature major or minor should consult with staff and/or faculty advisors at the Literature Department office as early as possible, and declare the major or minor before the end of their sophomore year. Transfer students are urged to declare their major or minor during their first quarter at UC Santa Cruz, and should also consult the section Transfer Information and Policy.

Program Learning Outcomes

Following is a summary of the program learning outcomes for the Literature B.A.:

Students who complete the literature major should emerge with the following knowledge and skills:

1. A capacity for critical analysis of texts that is attentive to:
 - the formal structures, genres, and rhetorical strategies of different kinds of writing, public discourse, and media;
 - the historical and social contexts of such texts;
 - the role cultural and linguistic differences play in the interpretation of texts read in translation and in a language not one's own.
2. Effective written communication that demonstrates the following abilities:
 - to evaluate multiple interpretations of texts;
 - to write effective argumentative prose;
 - to situate texts in relation to a critical/theoretical tradition;
 - to design and initiate a substantive independent project of research or creative activity.
3. Experience reading a variety of texts:
 - from a breadth of world cultures and traditions;
 - from different historical periods, including the pre-modern;
 - originally written in languages other than English.

Major Qualification Policy and Declaration Process

Major Qualification

Students must complete LIT 1 or its transfer equivalent in order to declare the literature major or minor.

Transfer students should also consult the section Transfer Information and Policy.

Appeal Process

Students notified that they are not eligible to declare the literature major may appeal this decision by submitting a letter to the department chair within 15 working days from the date of notification. Within 15 working days of receipt of the student's appeal, the department will notify the student and their college of its decision regarding the appeal.

How to Declare a Major

Students must complete LIT 1 or its transfer equivalent in order to declare the literature major. In order to declare the major, students meet with a department advisor to complete and submit a Proposed Study Plan and Declaration of Major/Minor petition. All students considering a major should consult with a department advisor as early as possible to make an academic plan.

Students who have not completed LIT 1 or its transfer equivalent and who are approaching the campus declaration deadline (their sixth quarter, for students admitted as frosh) may petition to declare the literature major. The petition will be approved or denied, or the student will be provided with conditions (completion of LIT 1 or its equivalent with a grade of C or better) that must be resolved within one additional quarter of enrollment.

Transfer Information and Policy

Transfer Admission Screening Policy

Students planning to apply to UC Santa Cruz in this major are not required to complete specific major preparation courses for consideration of admission to UC Santa Cruz.

Students transferring from California community colleges may use an articulated equivalent of LIT 1 to satisfy the LIT 1 course requirement. Students transferring from other colleges may petition to use an introduction to literature course to satisfy the LIT 1 course requirement. Another literature course may be applied toward the LIT 60/LIT 61 or the LIT 80/LIT 81 course requirement.

Transfer students planning to major in literature are strongly recommended to complete the equivalent of one year of college-level study of a language other than English before entering UC Santa Cruz.

Transfer students planning to major in literature with a language literature concentration are strongly recommended to have completed two years of college-level language study (or comparable ability) to allow for a two-year graduation.

Getting Started at UCSC as a Transfer Student

Transfer students may declare the literature major or minor after completing LIT 1 or its transfer equivalent, and are urged to declare the major during their first quarter at UC Santa Cruz.

For information about declaring the literature major or minor, please see the section How to Declare a Major.

A student may receive credit toward the lower-division requirements of the major or minor for up to two courses taken at other institutions.

Students who attend another campus of the University of California may petition to apply a maximum of three upper-division courses toward the literature major, or two upper-division courses toward the literature minor.

Students may not use upper-division coursework taken at non-UC colleges or universities to satisfy upper-division literature major or minor credit.

Letter Grade Policy

Letter grades are required for 75 percent of the upper-division courses applied toward the literature major. The senior seminar or senior thesis must be taken for a letter grade.

Course Substitution Policy

Students who participate in a UC Education Abroad Program and/or attend another campus of the University of California may petition to apply a combined maximum of three upper-division courses toward the literature major, or two upper-division courses toward the literature minor.

Students may petition to receive literature elective credit for a maximum of one upper-division course taken in another department at UC Santa Cruz. In order to petition for a course from another department to substitute for a literature elective, students should submit a current course syllabus to the literature undergraduate program coordinator. Courses accepted from other departments may not be used to satisfy the literature major's critical approaches or distribution requirements.

Double Majors and Major/Minor Combinations Policy

Study Abroad

The University of California's Education Abroad Program (EAP) operates study centers in countries throughout the world, all associated with host institutions of high academic standing. EAP serves more than 1500 upper-division students from the nine UC campuses every year. Students who participate in a UC Education Abroad Program may petition to apply up to three upper-division courses from EAP toward the literature major, or two upper-division courses toward the literature minor.

Honors

Honors in the literature major are awarded to graduating seniors who have earned a 3.70 to 3.89 grade-point average in their upper-division literature courses. Highest honors in the literature major are awarded to graduating seniors who have earned a 3.90 or higher grade-point

average in their upper-division literature courses. Honors are not awarded in the minor.

Creative Writing Courses

Any qualified student may take creative writing courses for credit toward graduation. Only students accepted into the creative writing concentration, however, may use Literature/Creative Writing courses LIT 179A, LIT 179B, LIT 190V, LIT 190W, and LIT 195C to satisfy major requirements.

Senior Checklist

Three quarters before anticipated graduation, all literature majors must complete a checklist in collaboration with a department advisor. The purpose of the checklist is to confirm progress toward graduation and the satisfaction of all major requirements. Completion and approval of a senior checklist are required for graduation.

Credit for Repeated Courses

Courses that vary significantly in material or methodology from one presentation to the next may be repeated for credit and are so designated in the course description in the UC Santa Cruz General Catalog.

Individual Study Credit for the Major

Students may apply a maximum of two of the following courses—LIT 195 (Senior Essay), LIT 198 (Group Tutorial), and/or LIT 199 (Tutorial)—for satisfaction of literature major requirements. LIT 195 may be used only once for satisfaction of literature major requirements.

Intensive Literature Major Option

The intensive literature major requires students to complete upper-division literature coursework in a second language. The intensive literature major is especially useful for students who plan to apply to graduate programs in literature and other humanities disciplines; those programs typically require students to do academic work in at least two languages. In order to satisfy an intensive literature major, students complete all of the requirements for a general literature, language literature, or creative writing concentration (including the critical approaches and distribution requirements); students must also complete at least two additional upper-division courses in a second-language literature studied in the original language, for a total of 14 courses (12 upper-division courses and two lower-division courses).

Two years of college-level language study (or comparable ability) are needed before a student is prepared to enter an upper-division language-literature course. In select languages (Greek, Latin, Middle Egyptian hieroglyphics, Sanskrit), less time is needed for this purpose.

General Literature Concentration

Course Requirements

The general literature concentration of the Literature major requires: (1) basic proficiency in a second language; and (2) 12 courses in literature.

- Basic language proficiency: One year (three quarters or equivalent) of college-level study of a non-English language or demonstrated reading ability at this level.
- The 12 required courses must include two lower-division and 10 upper-division courses.

Lower-Division Requirements

- Basic language proficiency: One year (three quarters or equivalent) of college-level study of a non-English language or demonstrated reading ability at this level.

Lower-division courses are introductions to critical reading and writing. Students should complete their lower-division coursework before beginning upper-division work.

- Two lower-division courses are required:

LIT 1	Literary Interpretation	5
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Plus

One LIT 60/LIT 61-series course

or

One LIT 80/LIT 81-series course

LIT 1 is a writing-intensive course.

LIT 60/LIT 61-series courses focus on categories, methodologies, and problems of literary study.

LIT 80/LIT 81-series courses focus on topical, thematic, and comparative studies of literary and filmic texts.

LIT 60/LIT 61 and LIT 80/LIT 81 courses are also recommended for non-majors.

Upper-Division Courses

Ten upper-division courses are required:

LIT 101	Theory and Interpretation	5
LIT 102	Translation Theory	5

Students must successfully complete the language proficiency requirement before enrolling in LIT 102.

Students may substitute one upper-division non-English literature course studied in the original language for LIT 102.

Plus

- Eight additional upper-division literature courses.

These eight courses must between them fulfill the critical approaches and distribution requirements specified below. Some courses may be used to fulfill more than one distribution requirement, as specified below.

Upper-division courses provide detailed treatment of literary and theoretical problems, themes, and periods. Students are strongly encouraged to take courses across chronological periods and national boundaries, and to balance small seminars with lecture courses.

Critical Approaches Requirements

- Six courses, one satisfying each of the six critical approaches to the study of literature.

While most upper-division courses have two critical approaches designations, no single course may be used to satisfy more than one critical approaches requirement.

Canons: The study of influential authors or works, and their critical afterlives: what books get read, which are forgotten, and how is that decided?

Genres: The study of fiction, poetry, drama, epic, testimonio, etc., across time and space: what happens when we classify together works of similar form?

Geographies: The study of local, regional, national, transnational, or global contexts: how do we use notions of place to group texts together?

Histories: The study of texts through socially or aesthetically defined periods or movements: how do historical pressures affect literature's possibilities?

Media: The study of the written word as one medium among others: what can we learn from the analysis of visual, performative, sonic, filmic, and other media?

Power and Subjectivities: The study of human and other subjects as individuals and in collective groups: who has the power to speak, write, and read under different social conditions?

The course descriptions in the General Catalog specify the critical approaches satisfied by each course.

These courses may also satisfy distribution requirements (below).

A list of annual course offerings indicating critical approaches and distribution codes for each course is available in the department office and on the Literature Department website.

Distribution Requirements

- Two upper-division courses on literature written before 1750.
- One upper-division course on non-Western literature or literature in a global perspective.
- One upper-division course on poetry and poetics (may not be a creative writing course).
- A senior seminar (a course in the LIT 190 series) or a senior thesis (LIT 195), which satisfies the campus comprehensive requirement (see below).

The course descriptions in the General Catalog specify the distribution requirements satisfied by each course.

Each of these courses may also satisfy a critical approaches requirement (above). Some courses satisfy more than one distribution requirement.

A list of annual course offerings indicating critical approaches and distribution codes for each course is available in the department office and on the Literature Department website.

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division disciplinary communication (DC) requirement. Literature majors must satisfy the disciplinary communication requirement by passing:

LIT 101 Theory and Interpretation 5

Comprehensive Requirement

Students must successfully complete LIT 101 before taking any comprehensive requirement.

Seniors must select one of the following options to satisfy the campus exit requirement:

Senior seminar.

The senior seminar (courses in the LIT 190 series) may be counted as one of the required upper-division courses. Several senior seminars are offered each quarter; extensive writing is required in all seminars.

Senior thesis.

Students who wish to propose a senior thesis (30–40 pages) must apply to a Literature Department faculty sponsor at least two quarters before the projected date of graduation. The application must include a proposed subject, a brief outline, a bibliography, and a sample of previous written work. Only those students who have received written permission from a faculty supervisor may complete a thesis to satisfy the senior exit requirement.

A student whose application has been approved may receive course credit toward the major for one independent study (LIT 195A or LIT 195B), and may count LIT 195A or LIT 195B as one of the upper-division courses required for the major.

Planners

Four-Year Major Planner

1st	LIT 60/LIT	LIT	LIT 1
(frosh)	61	60/LIT	
	or LIT	61	
	80/LIT 81	or LIT	
		80/LIT	
		81	
		(optiona	
		l)	

2nd (soph)	Upper-division LIT course (Media critical approach)	LIT 101	Upper-division LIT course (Power and Subjectivities critical approach)	r)	LIT course (Canons critical approach, pre-1750 distribution requirement)		
	Language Level 1	Language Level 2	Language Level 3		Upper-division LIT course (Genres critical approach, poetry distribution requirement)	Upper-division LIT course (Geographies critical approach, global distribution requirement)	Upper-division LIT course (Histories critical approach, pre-1750 distribution requirement)
3rd (junior)	Upper-division LIT course (Geographies critical approach, global distribution requirement)	LIT 102	Upper-division LIT course (Genres critical approach, poetry/poetics distribution requirement)				
			Upper-division LIT course (Canons critical approach, pre-1750 distribution requirement)	4th (senior)	Upper-division LIT course (Media critical approach)	LIT 190 (senior seminar)	Upper-division LIT course
					Upper-division LIT course (Power and Subjectivities critical approach)		
4th (senior)	Upper-division LIT course (Histories critical approach, pre-1750 distribution requirement)	LIT 190 (senior seminar)	Upper-division LIT course				
					Transfer Student Planner #2 (for transfer students who have completed no literature requirements or language coursework at the time of transfer, but have completed most general education requirements)		
				3rd (junior)	LIT 1	LIT 101	Upper-division LIT course (Genres critical approach, poetry distribution requirement)
Courses required for the major fulfill the TA General Education requirement. Other requirements may be fulfilled depending on the choice of electives. The MF, SI and SR requirements are never fulfilled.							
Transfer Student Planner #1 (for transfer students who have completed literature's lower-division and one-year language requirement at the time of transfer)					LIT 60/LIT 61 or LIT 80/LIT 81	Upper-division LIT course (Canons	Upper-division LIT course (Geograp
3rd (junior)	Upper-division	LIT 102	LIT 101				

		critical approach, pre-1750 distribution requirement)	hies critical approach, global distribution requirement)
	Language Level 1	Language Level 2	Language Level 3
4th (senior)	Upper-division LIT course (Histories critical approach, pre-1750 distribution requirement)	LIT 102	LIT 190 (senior seminar)
	Upper-division LIT course (Media critical approach)	Upper-division LIT course (Power and Subjectivities critical approach)	Upper-division LIT course

Language Literature Concentration

The language literature concentration examines literature within the frameworks of particular languages or national and regional traditions, and requires that texts be read in the original language. Enrollment in upper-division language literature courses normally requires completion of two years of college-level language coursework, or the equivalent.

Course Requirements

The language literature concentration of the literature major requires: (1) completion of two years of college-level language coursework, or the equivalent; and (2) 12 courses in literature.

- The 12 required courses must include two lower-division and 10 upper-division courses.

Lower-Division Requirements

- Language proficiency: Two years (six quarters or equivalent) of college-level study of a non-English language or demonstrated reading ability at this level.

Lower-division courses are introductions to critical reading and writing. Students should complete their lower-division coursework before beginning upper-division work.

- Two lower-division courses are required:
LIT 1 Literary Interpretation 5

Plus

One LIT 60/LIT 61-series course

or

One LIT 80/LIT 81-series course

LIT 1 is a writing-intensive course.

LIT 60/LIT 61-series courses focus on categories, methodologies, and problems of literary study.

LIT 80/LIT 81-series courses focus on topical, thematic, and comparative studies of literary and filmic texts.

LIT 60/LIT 61 and LIT 80/LIT 81 courses are also recommended for non-majors.

Upper-Division Courses

- Ten upper-division courses are required:
LIT 101 Theory and Interpretation 5
LIT 102 Translation Theory 5

Students must successfully complete the language proficiency requirement before enrolling in LIT 102.

Students may substitute one upper-division non-English literature course studied in the original language for LIT 102.

Plus

- Eight additional upper-division literature courses.

These eight courses must between them fulfill the requirements specified below. Some courses may be used to fulfill more than one requirement, as specified below.

Upper-division courses provide detailed treatment of literary and theoretical problems, themes, and periods. Students are strongly encouraged to take courses across chronological periods and national boundaries, and to balance small seminars with lecture courses.

Critical Approaches Requirements

- Six courses, one satisfying each of the six critical approaches to the study of Literature.

While most upper-division courses have two critical approaches designations, no single course may be used to satisfy more than one critical approaches requirement.

Canons: The study of influential authors or works, and their critical afterlives: what books get read, which are forgotten, and how is that decided?

Genres: The study of fiction, poetry, drama, epic, testimonio, etc., across time and space: what happens when we classify together works of similar form?

Geographies: The study of local, regional, national, transnational, or global contexts: how do we use notions of place to group texts together?

Histories: The study of texts through socially or aesthetically defined periods or movements: how do historical pressures affect literature's possibilities?

Media: The study of the written word as one medium among others: what can we learn from the analysis of visual, performative, sonic, filmic, and other media?

Power and Subjectivities: The study of human and other subjects as individuals and in collective groups: who has the power to speak, write, and read under different social conditions?

The course descriptions in the General Catalog specify the critical approaches satisfied by each course.

These courses may also satisfy distribution requirements (below).

A list of annual course offerings indicating critical approaches and distribution codes for each course is available in the department office and on the Literature Department website.

Language Literature Concentration Requirements

- Five courses in a single language literature.

French Literature (courses in the LIT 182 series)

The study of French and Francophone literatures, languages, and cultural practices of France, Africa, and the Caribbean.

German Literature (courses in the LIT 183 series)

The study of the literature, language, and cultural practices of the German-speaking areas of central Europe including Germany, Austria, and Switzerland.

Greek and/or Latin Literature (courses in the LIT 184 and LIT 186 series)

The study of the literature, languages, and cultural practices of ancient Greece and Rome. Students may choose to concentrate in Greek or Latin or both.

Italian Literature (courses in the LIT 185 series)

The study of Italian literature, language, and cultural practices from the Middle Ages to the present.

Spanish/Latin American/Latino Literatures (courses in the LIT 188-LIT 189 series, LIT 190X)

The study of literatures, language, and cultural practices of Spain, Latin America, and Latino populations in the United States.

Each of these courses may also satisfy one of the critical approaches requirements, and/or one or more distribution requirements (see below).

Distribution Requirements

- Two upper-division courses on literature written before 1750.
- One upper-division course on non-Western literature or literature in a global perspective.
- One upper-division course on poetry and poetics (may not be a creative writing course).
- A senior seminar (a course in the LIT 190 series) or a senior thesis (LIT 195), which satisfies the campus comprehensive requirement (see below).

The course descriptions in the General Catalog specify the distribution requirements satisfied by each course.

Each of these courses may also satisfy a critical approaches requirement (above). Some courses satisfy more than one distribution requirement.

A list of annual course offerings indicating critical approaches and distribution codes for each course is available in the department office and on the Literature Department website.

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division disciplinary communication (DC) requirement. Literature majors must satisfy the disciplinary communication requirement by passing:

LIT 101	Theory and Interpretation	5
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Comprehensive Requirement

Students must successfully complete LIT 101 before taking any comprehensive requirement.

Seniors must select one of the following options to satisfy the campus exit requirement:

Senior seminar.

The senior seminar (courses in the LIT 190 series) may be counted as one of the required upper-division courses. Several senior seminars are offered each quarter; extensive writing is required in all seminars.

Senior thesis.

Students who wish to propose a senior thesis (30–40 pages) must apply to a Literature Department faculty sponsor at least two quarters before the projected date of graduation. The application must include a proposed subject, a brief outline, a bibliography, and a sample of previous written work. Only those students who have received written permission from the faculty supervisor may complete a thesis to satisfy the senior exit requirement.

A student whose application has been approved may receive course credit toward the major for one independent study (LIT 195A or LIT 195B), and may count LIT 195A or LIT 195B as one of the upper-division courses required for the major.

Planners

approach)

Four-Year Major Planner

1st (fresh)	LIT 60/LIT 61 or LIT 80/LIT 81	LIT 60/LIT 61 or LIT 80/LIT 81 (optional)	LIT 1
2nd (soph)	Language Level 1 Upper- division LIT course (Canons critical approach, pre-1750 and poetry distribution requiremen ts)	Language Level 2 LIT 101	Language Level 3 Upper- division LIT course (Power and Subjectivit ies critical approach, global distributio n requireme nt)
3rd (junio r)	Language Level 4 Upper- division LIT Language course (Genres critical approach)	Language Level 5 LIT 102 Upper- division LIT Language course (Geograph ies critical approach)	Language Level 6 Upper- division LIT Language course (Histories critical approach, pre-1750 distributio n requireme nt)
4th (senio r)	Upper- division LIT Language course (Media critical approach)	Upper- division LIT Language course (Geograph ies critical approach)	LIT 190 (senior seminar)

Courses required for the major fulfill the TA general education requirement. Other requirements may be fulfilled depending on the choice of electives. The MF, SI and SR requirements are never fulfilled.

Transfer Student Planner #1 (for transfer students who have completed literature's lower-division, most general education requirements, and one year of language coursework at the time of transfer)

3rd (junio r)	Upper- division LIT course (Canons critical approach, pre-1750 and poetry distribution requiremen ts)	LIT 102	LIT 101
4th (senio r)	Language Level 4 Upper- division LIT Language course (Media critical approach)	Language Level 5 Upper- division LIT Language course (Genres critical approach)	Upper- division LIT Language course LIT 190 (senior seminar)

Transfer Student Planner #2 (for transfer students who have completed literature's lower-division requirements and two years of language coursework at the time of transfer)

3rd (junior)	Upper-division LIT Language course (Media critical approach)	LIT 102	LIT 101
		Upper-division LIT Language course (Canons critical approach)	Upper-division LIT Language course (Geographies critical approach)
4th (senior)	Upper-division LIT Language course (Histories critical approach, pre-1750 distribution requirement) Upper-division LIT course (Power and Subjectivities critical approach)	Upper-division LIT Language course (Genres critical approach, poetry distribution requirement) LIT 190 (senior seminar)	Upper-division LIT course (pre-1750 and global distributions)

Creative Writing Concentration

The Literature Department offers a sequence of creative writing workshops from introductory through advanced levels. Admission to the creative writing concentration is selective. Interested students are required to take one lower-division creative writing workshop at UC Santa Cruz (LIT 90, LIT 90X, LIT 91A or LIT 91B) before applying to the concentration; however, students are strongly encouraged to complete two lower-division workshops (at least one at UCSC) before applying. To apply for admission to the creative writing concentration, students should submit a completed application form (available at the Literature Department office and on the

Literature Department website). Once accepted into the concentration, students are required to declare (or redeclare) the major in literature, with a concentration in creative writing.

In addition to the critical approaches and distribution requirements required for all literature majors, students in the creative writing concentration must complete four of their eight upper-division literature courses in creative writing, including a senior project seminar.

Course Requirements

Lower-Division Requirements

- Basic language proficiency: One year (three quarters or equivalent) of college-level study of a non-English language or demonstrated reading ability at this level.

Lower-division courses are introductions to critical reading and writing. Students should complete their lower-division coursework before beginning upper-division work.

- Three lower-division courses are required:
LIT 1 Literary Interpretation 5

Plus

One LIT 60/LIT 61-series course

or

One LIT 80/LIT 81-series course

LIT 1 is a writing-intensive course.

LIT 60/LIT 61-series courses focus on categories, methodologies, and problems of literary study.

LIT 80/LIT 81-series courses focus on topical, thematic, and comparative studies of literary and filmic texts.

LIT 60/LIT 61 and LIT 80/LIT 81 courses are also recommended for non-majors.

Plus at least one of the following

LIT 90	Introduction to Creative Writing	5
LIT 90X	Introducción a la Escritura Creativa/Introduction to Creative Writing	5
LIT 91A	Intermediate Fiction/Prose Writing	5
LIT 91B	Intermediate Poetry Writing	5

An additional course from among LIT 90, LIT 90X, LIT 91A and LIT 91B is strongly encouraged.

Upper-Division Courses

Ten upper-division literature courses are required:

LIT 101	Theory and Interpretation	5
LIT 102	Translation Theory	5

Students must successfully complete the language proficiency requirement before enrolling in LIT 102.

Students may substitute one upper-division non-English literature course studied in the original language for LIT 102.

Plus

- Eight additional upper-division courses. These eight courses must between them fulfill the creative writing workshop, critical approaches, and distribution requirements specified below. Some courses may be used to fulfill more than one distribution requirement, as specified below.

Upper-division courses provide detailed treatment of literary and theoretical problems, themes, and periods. Students are strongly encouraged to take courses across chronological periods and national boundaries, and to balance small seminars with lecture courses.

Critical Approaches Requirements

Six courses, one satisfying each of the six critical approaches to the study of literature. While most upper-division courses have two critical approaches designations, no single course may be used to satisfy more than one critical approaches requirement.

Canons: The study of influential authors or works, and their critical afterlives: what books get read, which are forgotten, and how is that decided?

Genres: The study of fiction, poetry, drama, epic, testimonio, etc., across time and space: what happens when we classify together works of similar form?

Geographies: The study of local, regional, national, transnational, or global contexts: how do we use notions of place to group texts together?

Histories: The study of texts through socially or aesthetically defined periods or movements: how do historical pressures affect literature's possibilities?

Media: The study of the written word as one medium among others: what can we learn from the analysis of visual, performative, sonic, filmic, and other media?

Power and Subjectivities: The study of human and other subjects as individuals and in collective groups: who has the power to speak, write, and read under different social conditions?

Students in the creative writing concentration will fulfill the genres critical approaches requirement through an upper-division creative writing workshop (LIT 179A, LIT 179B, or LIT 179C); they will fulfill the Media Critical Approaches requirement through the creative writing senior project seminar (LIT 190V or LIT 190W) if they choose the Senior Seminar option to fulfill the comprehensive requirement.

The course descriptions in the General Catalog specify the critical approaches satisfied by each course.

These courses may also satisfy distribution requirements (below).

A list of annual course offerings indicating critical approaches and distribution codes for each course is available in the department office and on the Literature Department website.

Advanced Creative Writing Workshops

Three advanced writing workshops, as follows:
Fiction/Prose students: Any combination of three iterations of LIT 179A and/or LIT 179C

Poetry students: Any combination of three iterations of LIT 179B and/or LIT 179C

LIT 179A, LIT 179B, and LIT 179C satisfy the Genre component of the critical approaches requirements.

Distribution Requirements

- Two upper-division courses on literature written before 1750.
- One upper-division course on non-Western literature or literature in a global perspective.
- One upper-division course on poetry and poetics (may not be a creative writing course).
- A creative project senior seminar (LIT 190V [Fiction] or LIT 190W [Poetry]) or a senior thesis (LIT 195C), which satisfies the campus comprehensive requirement (see below).

The course descriptions in the General Catalog specify the distribution requirements satisfied by each course.

Each of these courses may also satisfy a critical approaches requirement (above). Some courses satisfy more than one distribution requirement.

A list of annual course offerings indicating critical approaches and distribution codes for each course is available in the department office and on the Literature Department website.

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division disciplinary communication (DC) requirement. Literature majors must satisfy the disciplinary communication requirement by passing:

LIT 101	Theory and Interpretation	5
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Comprehensive Requirement

Students must successfully complete LIT 101 before taking any comprehensive requirement.

Seniors must select one of the following options to satisfy the campus exit requirement:

Senior seminar

The senior seminar may be counted as one of the required upper-division courses. Extensive writing is required in all seminars. Creative writing senior seminars are offered only during spring quarter.

LIT 190V	Fiction Senior Seminar	5
LIT 190W	Poetry Senior Seminar	5

Senior essay

Students who wish to propose a creative writing senior essay (30–40 pages) must apply to a Literature Department faculty sponsor at least two quarters before the projected date of graduation. The application must include a proposed subject, a brief outline, a bibliography, and a sample of previous written work. Only those students who have received written permission from a faculty supervisor may complete a senior essay to satisfy the senior exit requirement.

A student whose application has been approved may receive course credit toward the major for one independent study (LIT 195C), and may count LIT 195C as one of the required upper-division courses for the major.

Note: LIT 195C does not satisfy the Media Critical Approaches requirement.
 LIT 195C Senior Essay 5

Planners

Four-Year Major Planner

1st (frosh)	LIT 60/LIT 61 or LIT 80/LIT 81	LIT 60/LIT 61 or LIT 80/LIT 81 (optional)	LIT 1
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2nd (soph)	Upper-division LIT course (Histories critical approach, pre-1750 distribution requirement)	LIT 101	Upper-division LIT course (Power and Subjectivities critical approach)
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	Language Level 1	LIT 90 or LIT 90X	LIT 91A or LIT 91B*
	Language Level 2	Language Level 2	Language Level 3

3rd (junior)	Upper-division LIT course (Geographies critical approach, global distribution)	LIT 102	LIT 179A, LIT 179B, or LIT 179C (Genres critical approach)
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requirement)

Upper-division LIT course (Canons critical approach, pre-1750 and poetry distribution requirements)

4th (senior)	LIT 179A, LIT 179B, or LIT 179C	LIT 179A, LIT 179B, or LIT 179C	LIT 190V or LIT 190W (Media critical approach, senior seminar)
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*Not required for the major, but strongly recommended before applying for admission to the Creative Writing concentration.

Courses required for the major fulfill the TA general education requirement. Other requirements may be fulfilled depending on the choice of electives. The MF, SI and SR requirements are never fulfilled.

Transfer Student Planner #1 (for transfer students who have completed literature's lower-division and one-year language requirements, and one creative writing course, at the time of transfer)

3rd (junior)	Upper-division LIT course (Canons critical approach, pre-1750 and poetry distribution requirements)	LIT 102	LIT 101
	Upper-division LIT course (Power and Subjectivities critical approach)	Upper-division LIT course (Geographies critical approach, global distribution requirement)	LIT 179A, LIT 179B, or LIT 179C (Genres critical approach)

	LIT 90 or LIT 90X or LIT 91A or LIT 91B)	h)	LIT course (Power and Subjectivities critical approach)	LIT course (Canons critical approach, pre-1750 and poetry distribution requirements)	190W (Media critical approach, senior seminar)
4th (senior)	LIT 179A, LIT 179B, or LIT 179C	LIT 179A, LIT 179B, or LIT 179C	LIT 190V or LIT 190W (Media critical approach, senior seminar)	LIT 179A, LIT 179B, or LIT 179C	LIT 179A, LIT 179B, or LIT 179C	
	Upper- division LIT course (Histories critical approach, pre-1750 distribution requirement)					

*Not required for the major, but strongly recommended before applying for admission to the Creative Writing concentration.

LITERATURE MINOR

Students who minor in literature take courses that examine a variety of literary texts and cultural artifacts from around the world, produced from pre-antiquity through the present. The literature minor requires a total of seven literature courses; literature minors do not have to satisfy certain major requirements such as second-language proficiency, distribution or critical approach requirements, or a senior seminar.

Students must complete LIT 1 or its equivalent prior to declaring the minor. In order to declare the minor, students meet with a department advisor to complete and submit a Proposed Study Plan and Declaration of Major/Minor petition. All students considering a minor should consult with a department advisor as early as possible to make an academic plan.

Course Requirements

The minor in literature requires seven courses.

Lower-Division Courses

Two lower-division courses are required:

LIT 1	Literary Interpretation	5
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This is a writing-intensive course.

Plus

One LIT 60/LIT 61-series course: categories, methodologies, and problems of literary study, or one LIT 80/LIT 81-series course: topical, thematic, and comparative studies of literary and filmic texts. LIT 60/LIT 61 and LIT 80/LIT 81 courses are recommended for both literature minors and non-majors.

Upper-Division Courses

Five upper-division courses are required:

LIT 101	Theory and Interpretation	5
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Transfer Student Planner #2 (for transfer students who have completed no literature requirements, language coursework, or creative writing course at the time of transfer, but have completed general education requirements)

3rd (junior)	LIT 1	LIT 60/61 or LIT 80/81	LIT 101
	LIT 90	LIT 91A or LIT 91B*	LIT 179A, LIT 179B, or LIT 179C (Genres critical approach)
	Language Level 1	Language Level 2	Language Level 3
4th (senior)	Upper- division LIT course (Histories critical approach, pre-1750 distribution requirement)	LIT 102	Upper- division LIT course (Geographies critical approach, global distribution requirement)
	Upper- division	Upper- division	LIT 190V or LIT

Plus

Four other upper-division literature courses (except creative writing courses). The literature minor does not require second-language proficiency or a senior seminar.

ITALIAN STUDIES MINOR

Students interested in an interdisciplinary approach to Italian culture through the combined study of language, literature, history, and art history may pursue a minor in Italian studies. A detailed checklist for the minor is available on the Italian studies program web site.

Staff advisers for the Italian studies minor are available in the Literature Department office, located in Humanities 1, room 303. The Italian studies program is administered by the Literature Department. Declaring a minor in Italian studies is a three-step process:

1. Complete the Petition for Major/Minor Declaration and submit it to litdept@ucsc.edu. Be sure to indicate your expected graduation term (EGT) on the petition. Your EGT is visible in your Student Advising Summary or on your MyUCSC Student Portal.
2. Make an appointment with the Italian studies program director to discuss your plans and fill out an Italian Studies Minor Checklist.
3. Make an appointment with an Italian studies advisor in the Literature Department in order to review and complete your declaration form. To schedule an advising appointment, visit ucsc.campus.eab.com, send an email to litdept@ucsc.edu, or leave a message at 831-459-4778.

Course Requirements**Lower-Division Courses**

Each student must complete the lower-division language sequence (ITAL 1–ITAL 6), or equivalent.

ITAL 1	First-Year Italian	5
ITAL 2	First-Year Italian	5
ITAL 3	First-Year Italian	5
ITAL 4	Second-Year Italian	5
ITAL 5	Second-Year Italian	5
ITAL 6	Second-Year Italian	5

Upper-Division Courses

Students must complete five upper-division courses in Italian studies as follows.

One course

ITAL 106	Italian Culture Through Film	5
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Plus

- Two Italian literature courses
- One course in Italian history
- One course in Italian art history.

A course featuring the work of Dante is recommended. Three of the five upper-division courses must be completed at UC Santa Cruz; three must be taught substantially in Italian. A maximum of two courses may be transferred from EAP.

Students can consult Italian studies course offerings (p. 221) for each of the above categories.

Students may also consult departmental websites to view available courses.

LITERATURE M.A.**Introduction**

The Master's Degree in Literature. A separate master of arts degree program is intended for students whose aim is to deepen and expand their literary/critical training and to prepare for entry into a Ph.D. program, usually at another institution. Priority for admission is given to students interested in underrepresented areas of study within the Literature Department's offerings, such as the non-English language literatures and, more broadly, critical theory.

The M.A. program requirements may not be completed in less than one year; the maximum time to obtain a degree is two years.

Requirements**Course Requirements**

- LIT 200, Proseminar, to be taken in fall quarter of the first year;
 - Seven additional courses leading to the definition of an area of concentration. Up to two of these may be taken in other departments. One may be an independent study course;
 - LIT 291F, a two-credit advising course, each quarter;
 - LIT 299A or LIT 299B, Thesis Research.
- | | | |
|----------|-----------------|----|
| LIT 200 | Proseminar | 5 |
| LIT 291F | Advising | 2 |
| LIT 299A | Thesis Research | 5 |
| LIT 299B | Thesis Research | 10 |

M.A. Thesis Description

The thesis for a Master's Degree in Literature will be a substantial critical work (typically ranging from 35 to 50 pages, plus a bibliography), written in conjunction with LIT 299. The project must be developed in close consultation with the thesis advisor, who serves as chair of the thesis reading committee, and ultimately be approved by at least two other reading committee members, who are chosen by the student and the advisor.

The majority of the reading committee must be members of the UC Santa Cruz Academic Senate (ladder-rank and Security of Employment faculty). The chair must be a

tenured member of the literature faculty. At least two of the three members of the committee should be literature faculty.

Once the student and advisor have chosen the reading committee members and secured their agreement to serve, the student must submit a Master's Thesis Reading Committee nomination form to the department office; this form should be submitted as early as possible and in any case no later than the second week of the quarter in which the degree is to be conferred.

M.A. Degree Application and Department Verification

An Application for the Master's Degree form must be submitted to the department at least one week prior to the Graduate Division deadline as stated on the academic calendar (normally by the end of the first week in which the degree is to be awarded).

The thesis is approved by all committee members up to six weeks, but no less than three weeks, prior to the last day of instruction (or commencement, if the student intends to participate in the ceremony). A copy of the title page, signed by all thesis committee members, must be submitted to the department for verification of completion. The department does not require a copy of the thesis.

The student must file the thesis with Graduate Division by the last day of instruction of the quarter in which the degree is to be conferred.

NOTE: In spring quarter, the deadline for students wishing participate in the commencement ceremony is approximately one week earlier. Guidelines for the style and filing requirements of the M.A. Thesis are detailed in the PDF "Dissertation & Thesis Guidelines", available on the Graduate Division website.

Admissions and Financial Aid

The Literature Department does not provide financial support to students pursuing the M.A. degree. Admission to the M.A. program does not constitute admission to the Ph.D. program. Students may not automatically transfer from the M.A. program into the Ph.D. program, but must reapply. Further information and application materials are available from the Division of Graduate Studies and on the department website.

[Optional Catchall]

Applying for Graduation

LITERATURE PH.D.

Introduction

The UC Santa Cruz doctoral program in literature offers an innovative multilingual and multidisciplinary approach to literary studies, involving the use of more than one language literature. The program is relatively small, and students work closely with faculty throughout their

graduate careers. They are encouraged to take advantage of the rich array of intellectual and cultural events, research clusters, and lectures offered on campus.

The doctoral program combines critical and independent thought with global perspectives. Working across linguistic, national, and period boundaries, students blend critical approaches, literary traditions, and/or cultural archives in comparative and interdisciplinary projects.

A creative/critical writing concentration within the Ph.D. program is available, for which students apply during the admissions process. Creative/critical applicants submit additional creative writing samples of poetry, prose fiction, creative non-fiction or hybrid/cross genre. Students in the creative/critical concentration complete all the requirements for the literature Ph.D. with the addition of a creative/critical degree component in the form of coursework, original creative work with a critical introduction and, if desired, work in poetics, translation, form and/or critical writing focused on creative practices.

Students may apply for a designated emphasis on the literature doctoral diploma in programs and departments such as Critical Race and Ethnic Studies, Education, Feminist Studies, History of Consciousness, Latin American and Latino Studies, Philosophy, Politics, Sociology, and the History of Art and Visual Culture. Applications and requirements are available at the respective department offices.

Advancement to Candidacy

Course Requirements

- LIT 200, Proseminar, to be taken in fall quarter of the first year;
- LIT 201, Pedagogy of Teaching/Teaching Assistant Training, to be taken prior to or in conjunction with the first teaching assistant appointment;
- Twelve additional courses leading to the definition of an area of concentration. At least two of these must be in a second-language literature; at least one must focus on pre-modern literature and culture. A minimum of six courses must be regularly scheduled Literature seminars;
- LIT 291F, a two-credit advising course, each quarter.

LIT 200	Proseminar	5
LIT 201	The Pedagogy of Literature	2
LIT 291F	Advising	2

Second Language Requirements

The program requires significant literary work in two languages. All students are required to complete the Literature Department's intensive three-week Graduate Summer Language Program or its equivalent and a minimum of two graduate courses in a second-language literature in which 50 percent or more of the reading is

done in the original language. The second literature must serve as a component of the qualifying examination.

Teaching Requirements

Students must complete at least three quarters of supervised teaching experience.

Pre-Qualifying Requirements

Qualifying Examination

The qualifying examination must be taken by the first quarter of the fourth year. It consists of three components: 1. a portfolio with a field statement and comprehensive bibliography, a topic statement, a paper of publishable quality, and a dissertation sketch; 2. translation examination; and 3. oral examination.

Post-Qualifying Requirements

Students must submit a prospectus outlining and defining the dissertation project within a quarter following the qualifying examination, but no later than the end of the fourth year. The prospectus identifies the research problem, methodologies, and case studies, with chapter outlines, footnotes, and bibliography.

Non-Terminal Master's Degree

A master of arts (M.A.) degree is conferred upon request to doctor of philosophy (Ph.D.) candidates who have successfully completed the literature Ph.D. qualifying examination or who have completed the coursework required for the doctorate (teaching assistant training and supervised teaching experience exempted) and elect to write a master's thesis under the supervision of a faculty advisor.

[Optional Catchall]

Dissertation

Dissertation

The dissertation is a substantial piece of original research in the field of literature, akin to a monograph.

A dissertation submitted for the Creative/Critical Concentration may take alternative forms:

1. A book-length original creative project--novel, novella, collection of poems, collection of stories, creative non-fiction, or a hybrid/experimental form (including but not limited to digital/new media, performance/performativity/screenplay, the lyric essay) with a critical chapter or chapters totaling at least 75 pages exploring the historical, methodological, and/or theoretical foundations of the creative work; or
2. A dissertation on theory, form poetics or literary history; a translation of a creative work with a 30-50-page, substantive, critical introduction; a critical edition.

The dissertation committee is composed of three members, with the dissertation advisor acting as chair. The majority of the membership of a dissertation committee shall be members of the Santa Cruz Division of the Academic Senate.

Detailed instructions for the preparation of the dissertation are available on the Graduate Division website.

Dissertation Defense

Academic Progress

To maintain satisfactory academic progress and eligibility for fellowships and other benefits, students must:

- complete required coursework in the first two to three years;
- satisfy the department's second-language requirement;
- pass the qualifying examination (QE) during the third year or fall quarter of the fourth year;
- complete a dissertation prospectus and advance to candidacy by the end of the fourth year; and
- complete the dissertation by the end of the seventh year.

Applying for Graduation

For information on how to apply for graduation, visit the Graduate Division website.

Further Information

Additional detailed information for prospective graduate students, including procedures for application and admission to graduate studies, examinations, and requirements for the doctor of philosophy degree, is available from the Division of Graduate Studies and on the department website.

LITERATURE DESIGNATED EMPHASIS

Introduction

Graduate students may work toward a Doctor of Philosophy (Ph.D.) degree that notes a designated emphasis in literature on the graduation documents. Students wishing to pursue this option should consult with the chair of their respective Ph.D. program and are encouraged to apply in the first or second year of graduate study.

Requirements

Graduate students in other programs may obtain a designated emphasis in literature on the Ph.D. degree by completing the following requirements:

Committee Composition and Departmental

Approvals

The student must have a faculty graduate adviser from Literature, who serves both on the qualifying examination committee and the dissertation reading committee.

Course Requirements

The student must take four graduate courses in literature. With the approval of the literature adviser, one of the four required graduate courses may be an independent study.

Writing, Research and/or Teaching Requirements

The student must prepare a significant piece of writing in the area of literature, such as a substantial seminar paper or a chapter of the doctoral dissertation. The adviser from Literature, in consultation with the student, determines whether a particular piece of writing meets this requirement.

Designated Emphasis Application

When the above requirements have been fulfilled, the formal steps to obtain the Designated Emphasis in Literature are:

- The student should complete Designated Emphasis Application form, obtain the literature adviser's signature and submit the application with supporting documentation (copies of the Qualifying Examination and Dissertation Committee Nomination forms) to the Literature Department graduate program coordinator.
- The Literature Department will notify the student and the home department of approval for the designated emphasis.

Academic Progress**[Optional Catchall]****ITALIAN STUDIES COURSE LIST****Course List****Italian Literature Courses**

LIT 185B	Letteratura e cultura italiana	5
LIT 185H	L'Opera italiana	5
LIT 185I	Teatro italiano	5
LIT 185J	Poesia moderna	5
LIT 185L	La novella italiana	5
LIT 185M	Fascismo e resistenza	5
LIT 185N	Le donne nell'Italia moderna	5
LIT 185P	Boccaccio: Decameron	5
LIT 185Q	Dante: Divina Commedia	5
LIT 185S	Petrarca	5
LIT 61L	True Stories: Memoir	5
LIT 114A	Orlando Furioso	5
LIT 114C	Dante's Divine Comedy	5

LIT 121G	The Idea of Poetry	5
LIT 155D	Italian Cinema and Literature	5
LIT 166C	Early Modern Italian Women Writers	5

Italian History Courses

HIS 164A	Late-Medieval Italy, c. 1200-1400	5
HIS 164B	Renaissance Italy, c. 1400-1600	5
HIS 183A	Nineteenth-Century Italy	5
HIS 183B	Fascism and Resistance in Italy	5
HIS 196C	Modern Italian Culture	5
HIS 196D	City of Rome	5
HIS 196Y	Saints and Holiness in Medieval Europe	5

Italian History of Art and Visual Culture Courses

HAVC 30	Introduction to European Visual Culture	5
HAVC 154	Byzantine Visual Culture: Politics and Religion in the Empire of Constantinople, 330-1453 A. C	5
HAVC 155	Constructing Cleopatra: Power, Sexuality, and Femininity Across the Ages	5
HAVC 157B	Italian Renaissance: Art and Architecture	5
HAVC 157C	High Renaissance	5
HAVC 157D	Art of the Venetian Renaissance	5

Courses Taught Substantially in Italian

LIT 185B	Letteratura e cultura italiana	5
LIT 185H	L'Opera italiana	5
LIT 185I	Teatro italiano	5
LIT 185J	Poesia moderna	5
LIT 185L	La novella italiana	5
LIT 185M	Fascismo e resistenza	5
LIT 185N	Le donne nell'Italia moderna	5
LIT 185P	Boccaccio: Decameron	5
LIT 185Q	Dante: Divina Commedia	5
LIT 185S	Petrarca	5
ITAL 100	Advanced Italian Composition and Conversation	5
ITAL 106	Italian Culture Through Film	5

Courses Featuring the Work of Dante

LIT 114C	Dante's Divine Comedy	5
LIT 185Q	Dante: Divina Commedia	5

Courses Featuring Italy in a European or Global Context

HAVC 137A	Northern Renaissance Art	5
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HAVC 137E	Renaissance Prints	5
HAVC 152	Roman Eyes: Visual Culture and Power in the Ancient Roman World	5
HIS 65A	From the Martyrs to the Vikings: Medieval Europe, 200-1000	5

Senior Seminars

HIS 196C	Modern Italian Culture	5
HIS 196D	City of Rome	5
HIS 196Y	Saints and Holiness in Medieval Europe	5

Philosophy

220 Cowell College
(831) 459-2070
<https://philosophy.ucsc.edu/>

PROGRAMS OFFERED

Philosophy B.A. (p. 222)

Philosophy Minor (p. 225)

Philosophy Contiguous Bachelor's/Master's Pathway (p. 225)

Philosophy M.A. (p. 226)

Philosophy Ph.D. (p. 227)

Philosophy Designated Emphasis (p. 228)

Philosophy investigates fundamental questions about the most basic facets of human thought and life, e.g., concerning knowledge and belief (epistemology), the nature of reality (metaphysics), and morality and aesthetics (value theory). Such questions can be studied by looking at answers that contemporary philosophers propose, by investigating the principles that other disciplines use to legitimate claims, or by learning how, historically, philosophers approached these issues. In this respect, “philosophy” names not only a historically defined subject matter, but also inquiry into any of the fundamental determinants of rational thought. Thus, students of philosophy can pursue a broad range of topics of the greatest historical, intellectual, social, political, and personal interest.

The programs offered by the Philosophy Department are designed to familiarize students with the central concepts and key debates in the core areas of contemporary philosophical thought and with the works of the major figures in the history of philosophy. The department offers an undergraduate major and a minor. The philosophy major leads to a bachelor of arts (B.A.) degree in philosophy. The graduate program leads to the master of arts (M.A.) and doctor of philosophy (Ph.D.) degrees in philosophy.

The department also offers a combined B.A./M.A. pathway which makes it possible for certain well-qualified, highly motivated students to complete the

requirements for both degrees in five years rather than the usual six.

PHILOSOPHY B.A.

Information and Policies

Introduction

Philosophy investigates fundamental questions about the most basic facets of human thought and life, e.g., concerning knowledge and belief (epistemology), the nature of reality (metaphysics), and morality and aesthetics (value theory). Such questions can be studied by looking at answers that contemporary philosophers propose, by investigating the principles that other disciplines use to legitimate claims, or by learning how, historically, philosophers approached these issues. In this respect, “philosophy” names not only a historically defined subject matter, but also inquiry into any of the fundamental determinants of rational thought. Thus, students of philosophy can pursue a broad range of topics of the greatest historical, intellectual, social, political, and personal interest.

The department offers courses that relate these traditional philosophical questions to contemporary work in literature and the social and natural sciences. In addition, the department offers several courses that make a careful study of the classic texts in philosophy, ancient and modern. Moreover, the curriculum covers many of the dominant contemporary schools of philosophy in the Anglo-American and European traditions.

The study of philosophy enables students to expand their abilities in critical thinking and reasoning as well as to improve their skills in verbal and written communication. Students may major or minor in philosophy.

Philosophy prepares students for many careers as well as for most professional schools, including law, education, business, and non-profit management. Students who wish to go to graduate school in philosophy are encouraged to study logic at both the introductory and intermediate levels and any languages that are necessary for advanced scholarship in the different historical eras of philosophy.

Academic Advising for the Program

For undergraduate advising, please contact philadvi@ucsc.edu. For transfer students, please also consult the Transfer Information and Policy section and contact the undergraduate advisor with any questions.

Getting Started in the Major

Program Learning Outcomes

Students who complete the philosophy major should emerge with the following knowledge and skills:

- an ability to argue cogently for a philosophical point and to analyze and criticize the arguments of others;

- a familiarity with the central concepts and key debates in the core areas of contemporary philosophical thought, including ethics, metaphysics, and epistemology;
- a familiarity with the works of the major figures in the history of philosophy; and
- a familiarity with formal logic, including the ability to carry out proofs within symbolic formal systems.

Major Qualification Policy and Declaration Process

Major Qualification

Undeclared students may declare the major once they have enrolled in at least one lower-division philosophy course. Students of any year can declare the major. While specific courses are not required in order to declare, students will have ideally completed some or all of the lower-division requirements. There is no GPA requirement to declare the philosophy major. A student approaching the campus declaration deadline who has not enrolled in any philosophy courses will be allowed to declare the philosophy major if they enroll in a lower-division philosophy course in the next quarter. Students should contact philadvi@ucsc.edu in order to declare.

Appeal Process

How to Declare a Major

In order to officially declare, students must schedule a meeting with the undergraduate advisor and complete an Academic Plan and Petition for Major/Minor Declaration form. Students should contact philadvi@ucsc.edu in order to declare.

Transfer Information and Policy

Transfer Admission and Screening Policy

Students planning to apply in this major are not required to complete specific major preparation courses for consideration of admission to UC Santa Cruz. Although this is not required for admission, students are recommended to complete courses in the following areas:

- Introduction to Symbolic Logic
- Ancient Philosophy
- Modern Philosophy
- Ethical Theory
- Philosophy of Mind or Epistemology

Students may petition to substitute courses taken at other institutions, or take courses articulated on assist.org. Please note that logic classes offered at community colleges will not fulfill the department's logic requirement (i.e., PHIL 9). However, most students

should be able to satisfy their second required lower-division introductory course before transferring in.

Transfer students wishing to major in philosophy are encouraged to consult with the Philosophy Department undergraduate advisor as soon as possible.

Getting Started at UCSC as a Transfer Student

Students can declare the major once they are enrolled in or have taken one philosophy course. To declare the major, please contact the undergraduate advisor and complete an Academic Plan and Petition for Major/Minor Declaration form.

Letter Grade Policy

This program does not have a letter grade policy.

Course Substitution Policy

For majors, students are allowed to substitute two upper-division courses for their required philosophy courses. Lower-division courses completed elsewhere may also be considered. Substitution requests are to be made via petition to and are subject to approval by the undergraduate program director. Students must have received a B or higher to transfer a course for credit.

Double Majors and Major/Minor Combinations Policy

Study Abroad)

Honors

Graduation with Honors in Philosophy requires at least a 3.7 average in all philosophy courses taken at UC Santa Cruz. Graduation with Highest Honors in Philosophy requires at least a 3.9 average in all philosophy courses taken at UCSC. Students with an average between 3.8 and 3.9 may be awarded Highest Honors by vote of the Philosophy Department.

Program Planning Notes

When a faculty member thinks that a student has done exceptional work that could be carried to a more advanced level, the student may be given the option of writing a senior essay (PHIL 195A). Normally, the senior essay is completed in one quarter; in unusual circumstances, it can be continued for a second quarter (PHIL 195B), but only if the writing requirements for PHIL 195A are completed successfully and on time. The senior essay, like individual studies more generally, does not count toward the 11 courses required for the major.

After undergraduates have taken the requisite lower-division courses, they have a wide range of upper-division courses from which to choose. Those who are considering advanced study are encouraged to consult regularly with any member of the philosophy faculty about the courses that would best prepare them for graduate work. Preparation for graduate work ought to begin before senior year. The Philosophy Department

sponsors workshops for students contemplating graduate school in philosophy.

Requirements and Planners

Course Requirements

Eleven courses are required: two at the lower-division level, two in the history of philosophy sequence (PHIL 100A, PHIL 100B, PHIL 100C), six additional upper-division courses (including one advanced seminar), and an elective course which may be from any level. These 11 courses must meet the following distribution requirements:

Lower-Division Courses

The following course:

PHIL 9	Introduction to Logic	5
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Plus

At least one other course numbered below PHIL 100A, with the exception of PHIL 8.

Transfer students should check Assist.org for articulation agreements.

Upper-Division Courses

History of philosophy

Two of the following courses:

PHIL 100A	Ancient Greek Philosophy	5
PHIL 100B	The Rationalists	5
PHIL 100C	The Empiricists	5

All three are strongly recommended for students who anticipate graduate work in philosophy.

Plus

Six courses numbered PHIL 100A or above, at least one in value theory and two in metaphysics and/or epistemology.

Note that the two courses counted toward fulfilling the history of philosophy requirement cannot be counted among these six additional courses.

Courses satisfying the value theory requirement:

PHIL 118	Stoic Ethics	5
PHIL 140	History of Ethics	5
PHIL 142	Advanced Ethics	5
PHIL 143	Applied Ethics: Ethics Bowl	5
PHIL 144	Topics in Social and Political Philosophy	5
PHIL 147	Topics in Feminist Philosophy	5
PHIL 148	The Holocaust and Philosophy	5
PHIL 152	Aesthetics	5
PHIL 153	Philosophy of Race	5

Courses satisfying the metaphysics and

epistemology requirement:

PHIL 106	Kant	5
PHIL 113	The History of Analytic Philosophy	5
PHIL 114	Probability and Confirmation	5
PHIL 121	Epistemology	5
PHIL 122	Metaphysics	5
PHIL 124	Other Minds	5
PHIL 125	Philosophy of Science	5
PHIL 126	Philosophy of Social Sciences	5
PHIL 127	Philosophy of Biology	5
PHIL 133	Philosophy of Mind	5
PHIL 135	Philosophy of Psychology	5

PHIL 195A, PHIL 195B, and PHIL 199 also cannot be counted among these six courses.

Senior Seminar

One advanced seminar numbered:

PHIL 190	Senior Seminar	5
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Elective

An 11th course which may be from any level.

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement in philosophy is met by completing any two from the sequence:

PHIL 100A	Ancient Greek Philosophy	5
PHIL 100B	The Rationalists	5
PHIL 100C	The Empiricists	5

Comprehensive Requirement

In the fourth year, students satisfy the comprehensive (exit) requirement by taking one course numbered 190. This advanced seminar meets the standards of the senior-year level of achievement in philosophy. Students who do superior work in an advanced seminar can be awarded a notation of Honors in the evaluation for that course.

PHIL 190	Senior Seminar	5
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Planners

Courses must be satisfied in the following sequence. Before being eligible to enroll in any course in the history sequence (PHIL 100A-PHIL 100B-PHIL 100C), a student must have completed two lower-division courses (one of these may be PHIL 8 or PHIL 9, but not both). Before being eligible to enroll in any philosophy course above PHIL 100C, students must have taken PHIL 9 and at least one of the required history of philosophy courses (i.e., either PHIL 100A, PHIL 100B, or PHIL 100C). In addition to the specific courses shown in these planners, a student must complete courses satisfying the general education requirements.

Four-Year Major Planner

	Fall	Winter	Spring
1st (frosh)	PHIL 11	PHIL 9	PHIL 100C
2nd (soph)	PHIL 100A	PHIL 100B (elective)	PHIL 1XX (M&E)
3rd (junior)	PHIL 1XX (Value)	PHIL 1XX (elective)	PHIL 1XX (M&E)
4th (senior)	PHIL 1XX (elective)		PHIL 190

PHIL 9 satisfies the MF general education requirement and PHIL 11 satisfies the TA general education requirement (Other lower-division courses may satisfy different GE requirements). Students must complete all other GE requirements.

Two-Year Transfer Major Planner

	Fall	Winter	Spring
1st (junior)	PHIL 11 or PHIL 22 (if needed) PHIL 9	PHIL 100B	PHIL 100C PHIL 1XX (M&E)
2nd (senior)	PHIL 100A (elective) PHIL 1XX (Value)	PHIL 1XX (elective) PHIL 1XX (M&E)	PHIL 1XX PHIL 190

Before transferring, students should complete as many of their general education as possible and their lower-division introductory philosophy course.

PHILOSOPHY MINOR

Course Requirements

Students must have taken or currently be enrolled in at least one lower-division philosophy course in order to declare the minor. Students declare by contacting the undergraduate advisor, who will develop an individual academic plan and complete a Petition for Major/Minor Declaration form. Students should contact philadvi@ucsc.edu in order to declare.

A minor in philosophy consists of seven of the 11 courses required for the major, and will meet the following distribution requirements:

Lower-Division Courses

The following course:

PHIL 9	Introduction to Logic	5
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Plus

One other course numbered below PHIL 100A, with the exception of PHIL 8.

Transfer students should check Assist.org for articulation agreements.

Upper-Division Courses

History of Philosophy

One of following courses:

PHIL 100A	Ancient Greek Philosophy	5
PHIL 100B	The Rationalists	5
PHIL 100C	The Empiricists	5

Plus

Four additional upper-division courses numbered 100A or above. This includes one in value theory and two in metaphysics and/or epistemology (see Philosophy B.A. course requirements for a list of courses that satisfy this requirement).

Course Substitution Policy

One upper-division course substitution may be considered, but lower-division courses may not be substituted for an upper-division requirement. Lower-division courses completed elsewhere may also be considered. Substitution requests are to be made via petition to and are subject to approval by the undergraduate program director. There is no senior exit requirement for the minor.

For the sequence in which courses must be taken, see Major Requirements.

PHILOSOPHY CONTIGUOUS BACHELOR'S/MASTER'S PATHWAY

The B.A./M.A. pathway is an option that allows students to complete the requirements for both degrees in five years, rather than the usual six.

Interested students with a GPA of at least 3.5 will be asked to indicate their intention to participate in the program no later than the seventh week of the spring quarter of their junior year (spring quarter advising week). Intentions to participate should be directed to the undergraduate staff advisor. Subject to instructor consent, students may then enroll in two graduate philosophy seminars in their senior year.

Actual admission to this program requires that students apply to the M.A. program through the standard graduate admissions process as specified on the UCSC's Graduate Division's website. If a student is then admitted, up to two graduate philosophy seminars taken in their senior year will count as credit toward their graduate degree. Students matriculating through the B.A./M.A. pathway will be required to take the remaining seven courses required for the M.A., as well as to write and defend their M.A. capstone paper, in the fifth year. Those needing additional time may continue in the pathway in accordance with normative time expectations for the stand-alone master's program.

PHILOSOPHY M.A.

Introduction

The M.A. program is host to talented students from diverse academic backgrounds. The program is open not only to applicants who majored in philosophy as undergraduates, but also to applicants from other disciplines, who have a significant background in philosophy and who now want to study philosophy more intensively. The program is designed to be completed in one to two years.

Preparation for the Master's Degree

Students can apply to be admitted into the graduate program to pursue the M.A. in philosophy. Interested students should discuss the possibility with one or more faculty members and formally apply online to the graduate program during fall quarter. For up-to-date information about the application process, consult the department's website and contact the graduate advisor.

Relationship of the M.A. and Ph.D. Programs

Students in the M.A. and Ph.D. programs will be in the same classes and work on the same course distribution requirements. Enrollment in the M.A. program confers no advantage for admission to the Ph.D. program.

Applications and Admissions

Application materials are available online. Further information regarding the program may be requested from the Department of Philosophy at (831) 459-4578, fax: (831) 459-2650 or visit the department website.

Requirements

Course Requirements

Requirements in the First Year

During their first year, all graduate students are expected to fulfill a set of breadth requirements. These requirements are designed to provide both a common experience on which students can build their individual projects and a shared framework within which they can exchange ideas. Every graduate student in philosophy is required to complete six courses in their first year. These six core courses will constitute the bare minimum of courses required for the M.A. or Ph.D.

This minimal core set of courses will consist of (i) three graduate seminars, designated by the department each year as mandatory for every first year student, and (ii) three electives (any three graduate seminars in philosophy). Of the three required seminars, one will be in metaphysics/epistemology, one in the history of philosophy, and one in moral philosophy.

No courses labeled PHIL 294 or higher will satisfy any of these minimum core requirements. This restriction is redundant for PHIL 299 (since that course is open only to students who have advanced to candidacy). The point of this restriction is to limit the use of independent studies, reading groups or student seminars for graduate seminar credit.

During their first year of study all students must pass a logic competency examination with a grade of B or better. This examination will cover material typically taught in a first course in formal logic.

To facilitate the professionalization of students in the exchange and development of academic knowledge and skills, all first- and second-year doctoral students will be required to enroll in:

PHIL 280	Graduate Colloquia Course	2
PHIL 281	The Pedagogy of Philosophy	2

PHIL 280, Graduate Colloquia Course, provides preparation for and requires attendance at all department-sponsored colloquia and works-in-progress presentations each quarter.

PHIL 281, The Pedagogy of Philosophy, provides training in university-level teaching in general and in the pedagogy of philosophy specifically. It meets during the fall quarter only.

For further details, see the department's web page or consult with the department's graduate advisor.

Courses

A minimum of nine graduate courses. Up to two courses may be taken from the offerings of other departments, and up to two courses may be independent studies.

Other Requirements

By the end of the second year of study and the completion of 45 credits, M.A. students will submit a master's capstone paper, which will normally be defended before a committee of two faculty.

[Optional Catchall]

Applying for Graduation

Students apply to graduate by contacting the department graduate advisor and completing the relevant forms from Graduate Division.

PHILOSOPHY PH.D.

Introduction

The Ph.D. program provides students with closely monitored training in philosophy. The program is designed to be completed in six years or less. Graduate work in philosophy can lead to careers both inside and outside academia. Because most doctoral students will be preparing for a career that involves teaching philosophy, they are encouraged to be teaching assistants for at least three quarters.

The department has three distinguishing characteristics: a focus on philosophy understood through its history, an emphasis on the relation of philosophy to science, and an eclecticism regarding philosophical styles.

The department's faculty recognize the importance of doing philosophy in a way that is sensitive to its history. Their commitment to the history of philosophy extends from Ancient Philosophy to several of the main figures and topics in 20th century philosophy, and covers a wide range of topics and historical figures in between.

The department also has a focus on the relation of philosophy to science. Every member of the department is currently engaged in empirically informed philosophical research, or research in the history of science or the philosophy of science, or both.

Finally, while grounded in the analytic tradition, the department has an eclectic philosophical profile, manifested in its openness to a variety of philosophical styles, including continental philosophy, and in the importance it places on making philosophy relevant, beneficial, and accessible to the public. This eclecticism, which, among other things, fosters an academic environment that allows our students and faculty to make intellectual connections with academics in other disciplines and members of the general public, makes UC Santa Cruz a unique and attractive place to study philosophy.

Relationship of the M.A. and Ph.D. Programs

Students in the M.A. and Ph.D. programs will be in the same classes and work on the same course distribution requirements. Enrollment in the M.A. program confers no advantage for admission to the Ph.D. program.

Applications and Admissions

Application materials are available online. Further information regarding the program may be requested from the Department of Philosophy at (831) 459-4578, fax: (831) 459-2650 or by visiting the department website.

Advancement to Candidacy

Course Requirements

Requirements in the First Year

During their first year, all graduate students are expected to fulfill a set of breadth requirements. These requirements are designed to provide both a common experience on which students can build their individual projects and a shared framework within which they can exchange ideas. Six courses, to be completed in the first year, are required of every graduate student in philosophy. These six core courses will constitute the bare minimum required for the M.A. or Ph.D.

This minimal core set of courses will consist of (i) three graduate seminars, designated by the department each year as mandatory for every first year student, and (ii) three electives (any three graduate seminars in philosophy). Of the three required seminars, one will be in metaphysics/epistemology, one in the history of philosophy, and one in moral philosophy.

No courses labeled PHIL 294 or higher will satisfy any of these minimum core requirements. This restriction is redundant for PHIL 299 (since that course is open only to students who have advanced to candidacy). The point of this restriction is to limit the use of independent studies, reading groups or student seminars for graduate seminar credit.

During their first year of study all students must pass a logic competency examination with a grade of B or better. This examination will cover material typically taught in a first course in formal logic.

To facilitate the professionalization of students in the exchange and development of academic knowledge and skills, all first- and second-year doctoral students will be required to enroll in:

PHIL 280	Graduate Colloquia Course	2
PHIL 281	The Pedagogy of Philosophy	2

PHIL 280, Graduate Colloquia Course, provides preparation for and requires attendance at all department-sponsored colloquia and works-in-progress presentations each quarter.

PHIL 281, The Pedagogy of Philosophy, provides training in university-level teaching in general and in the pedagogy of philosophy specifically. It meets during the fall quarter only.

A minimum of 12 graduate courses

Up to two courses may be taken from the offerings of other departments, and up to two courses may be independent studies.

Foreign Language Requirements

The foreign language will be individually determined based on the relevance of such linguistic skills to the research interests of the student. Proficiency can be demonstrated either by passing a written examination administered by the department or by successfully completing a language course approved by the graduate committee.

Teaching Requirement**Pre-Qualifying Requirements****Qualifying Examination****Qualifying examination and Research Seminar**

The qualifying examination, normally taken during the third year of enrollment, is centered on a qualifying essay that demonstrates the candidate's ability to do extended, dissertation-level research and analysis relevant to the proposed thesis topic and dissertation plan. The examination focuses on the student's research project and on the fields of scholarship it presupposes.

Near the end of the required coursework, doctoral students will develop a research project resulting in a substantial paper. The paper is required to enroll in the research seminar, PHIL 270, which must be completed during or before winter quarter of the third year. The seminar will allow students to make substantial progress on a qualifying essay and cultivate their ability to assess and provide critical feedback on another author's philosophical work. PHIL 270 is only offered in winter quarter, and will normally be taken in the third year, though with permission of the instructor, it may be taken earlier than the third year. It is optional for M.A. students.

Post-Qualifying Requirements**[Optional Catchall]****Dissertation****Dissertation****Prospectus**

Within one year of passing the qualifying examination (usually during the fourth year) doctoral students will submit and defend a dissertation prospectus, consisting of some written foundation and a plan for completion of the dissertation. The committee for the prospectus defense is normally the dissertation committee.

The prospectus will be submitted at least one month prior to the defense. It will normally consist of:

1. A detailed outline or table of contents of the entire dissertation
2. A bibliography indicating knowledge of the scope of the relevant literature
3. A paper that would be suitable as a chapter of the dissertation and that (a) clearly shows the potential for developing the rest of the dissertation, or (b) lays out the central problem which the dissertation will address.

Dissertation

The final requirement for the Ph.D. degree is a dissertation representing a contribution to philosophical research. Students submit their dissertation committee to the department for approval once they complete their qualifying exam. They may change their committee at a later time pending department approval. This committee is submitted to Graduate Division for final approval.

Dissertation Defense**Academic Progress****Applying for Graduation**

Students apply to graduate by contacting the department graduate advisor and completing the relevant paperwork from graduate division.

[Optional Catchall]**PHILOSOPHY DESIGNATED EMPHASIS****Introduction****Requirements**

To receive a designated emphasis in philosophy, graduate students from other departments must complete the following requirements in addition to degree requirements for the doctorate in their home department.

Guidelines and application forms are available in the Philosophy Department office.

Committee Composition and Departmental Approvals

A Philosophy Department faculty member is to be consulted about the intention to pursue a philosophy designated emphasis. This advisor is required to serve on both the qualifying examination committee and the dissertation reading committee.

Course Requirements

Students must complete four graduate courses in philosophy selected in consultation with the philosophy faculty advisor. One of the four may be an independent study approved by the philosophy faculty advisor.

Writing, Research and/or Teaching Requirements

Students must submit a significant piece of writing that demonstrates competency in the field. The writing could take the form of a seminar paper or dissertation chapter. The essay must meet the approval of the philosophy advisor.

Academic Progress

[Optional Catchall]

Writing Program

209 Humanities 1
(831) 459-2431
<https://writing.ucsc.edu>

PROGRAMS OFFERED

Academic Literacy Curriculum (p. 230)

The Writing Program offers lower-division general education composition courses, upper-division peer tutoring courses, and graduate-level pedagogy courses. In collaboration with the colleges, the Writing Program administers the Academic Literacy Curriculum. The Writing Program also houses the Don Rothman Endowed Award in First-Year Writing, which honors outstanding first-year writers and recognizes the pedagogical inspirations of their teachers.

LOWER-DIVISION COURSES

The Writing Program's lower-division courses are designed to help students become confident writers, learners, and researchers who communicate effectively in a variety of writing situations and disciplinary fields. These courses teach students how to develop analytical, reflective, and flexible writing practices to meet the expectations of academic, professional, and civic audiences.

Specifically, the program offers courses that satisfy:

- General Education Composition (C) Requirement
 - WRIT 2, Rhetoric and Inquiry (F, W, S)
Prerequisite(s): College 1 and satisfaction of the Entry-Level Writing Requirement by exam or course selection via Directed Self-Placement; or College 80A, 80D, or 80F and satisfaction of the C1 requirement
 - WRIT 2H, Rhetoric and Inquiry Honors (W, S)
Prerequisite(s): College 1 and satisfaction of the Entry-Level Writing Requirement by exam or course selection via Directed Self-Placement. Enrollment is restricted to College Scholars Program or students with an Analytical Writing Placement Exam (AWPE) score of 10-12 or equivalent

- Systemwide Entry-Level Writing Requirement (ELWR)
 - WRIT 1, Introduction to Composition (W, S)
Prerequisite(s): College 1 and WRIT 26; or College 1 and course selection via Directed Self-Placement
 - WRIT 1E, Introduction to Composition for Multilingual Students (W, S)
Prerequisite(s): College 1 and WRIT 26; or College 1 and course selection via Directed Self-Placement

Students from previous catalog years may place into WRIT 1 and WRIT 1E based on AWPE scores.

For more information about the Directed Self-Placement process, please visit the DSP website.

For more information regarding undergraduate campus requirements and course offerings, please visit the Writing Program's website.

The Writing Program also offers the **Multilingual Curriculum** for linguistically diverse students. These courses are designed to strengthen students' use of English for purposeful, authentic, and culturally appropriate communication. These courses prepare students for subsequent writing requirements, including the systemwide Entry-Level Writing Requirement (ELWR) and the campus's General Education Composition (C) Requirement.

Based on students' course selection via Directed Self-Placement, multilingual students may place into the following courses, which are taken prior to the ELWR (WRIT 1 or WRIT 1E) and C Requirement (WRIT 2 or WRIT 2H):

- WRIT 25, Writing about Place (F, W)
Prerequisite(s): Course selection via Directed Self-Placement
- WRIT 26, Writing about Language (F, W, S)*
Prerequisite(s): WRIT 25 or course selection via Directed Self-Placement

Students from catalog years 2018-2019 and 2019-2020 may place into WRIT 25 and WRIT 26 based on AWPE-MLS scores.

*Upon completion of WRIT 26, multilingual students are highly encouraged to take WRIT 1E, which carries the same outcomes as WRIT 1 but is taught by trained faculty with expertise in language acquisition.

For a full list of Writing Program course descriptions, please visit the courses page on our website.

UPPER-DIVISION WRITING COURSES

The Writing Program offers courses for undergraduates interested in serving as peer tutors for lower-division

writing students striving to satisfy the Entry-Level Writing Requirement. By exploring theory and research on writing pedagogies, tutors gain insight into composing processes, meeting the academic needs of diverse learners, and providing responsive assistance in one-to-one tutoring settings.

- WRIT 159: Grammar for Tutors and Teachers (3 credits, S)
Prerequisite(s): WRIT 169, or by instructor permission
- WRIT 169: Theory and Practice of Tutoring Writing (3 credits, W)
Prerequisite(s): C requirement and by instructor permission

GRADUATE-LEVEL WRITING COURSES

The Writing Program supports graduate education by offering pedagogical training for graduate students from all disciplines in the theory and practice of teaching composition courses, with an emphasis on course and assignment design that foregrounds disability studies and inclusive teaching. This course is designed for students who would like to serve as graduate student instructors in the Writing Program or enhance their own pedagogical development as teaching assistants in other departments.

- WRIT 203, Teaching Writing (F, W)

Note: Courses in creative writing are offered through the Literature Department.

Academic Literacy Curriculum

ACADEMIC LITERACY CURRICULUM

The Academic Literacy Curriculum (ALC) is an articulated sequence of courses jointly administered by the colleges and the Writing Program (p. 229). This curriculum is designed to help first-year students cultivate the foundational proficiencies in critical reading, writing, critical thinking, and research they will need throughout their university career.

All first-year students begin the ALC by taking College 1 (Core Course), Academic Literacy and Ethos, in the fall quarter. College 1 course learning outcomes are organized through the acronym ACMES: Analysis, Critical Thinking, Metacognition, Engagement with Others, and Self-Efficacy. This course teaches students strategies for critical reading and critical thinking important to the study of academic discourse through themes that are unique to each college. For specific descriptions of College 1 (Core Course) by residential college, please visit the individual program statements for the colleges.

After the successful completion of College 1, students

will take a course to satisfy the Entry-Level Writing Requirement (ELWR) and/or will enroll in WRIT 2, Rhetoric and Inquiry, to satisfy the campus's Composition (C) General Education Requirement. This course provides students with conceptual and procedural knowledge about writing, with a special focus on writing from research, composing in multiple genres, and transferring knowledge about writing to new contexts. College 1 is a prerequisite for WRIT 2 and WRIT 1 and corequisite for WRIT 25 and/or WRIT 26..

The Writing Program also offers sections of WRIT 2 Honors for students in the College Scholars Program or who score 10-12 on the AWPE or equivalent. This course carries the same outcomes as WRIT 2 but provides an in-depth focus on conducting sustained scholarly inquiry about one topic throughout the quarter.

Academic Literacy Curriculum Course Sequence

ELWR Status	Fall	Winter
ELWR Satisfaction via Directed Self-Placement or accepted standardized test scores	College 1	WRIT 2
ELWR Satisfaction and College Scholars Program or ELWR Satisfaction and AWPE score of 10-12 or equivalent	College 1	WRIT 2 or WRIT 2H

Together, College 1 and WRIT 2 help students transition to university-level discourse and develop confidence and competency in the basic skills necessary to succeed in any discipline on campus. As a linked sequence of classes, with articulation of academic vocabulary and pedagogical practices between the Colleges and the Writing Program, the ALC is the foundation of the First-Year Experience, with the higher aim of fostering a sense of belonging and the ability to think, at a metacognitive level, about the education students will receive at the university.

PATHWAYS FOR ELWR-REQUIRED STUDENTS

Students who have not satisfied ELWR before matriculation via accepted standardized test scores or Directed Self-Placement have various pathways for satisfying ELWR and completing the ALC requirements. These pathways, outlined in the table below, are based on the course sequence selected via the Directed Self-Placement process.

ELWR Student Pathways for the Academic Literacy Curriculum

Fall	Winter	Spring	Fall 2
College 1	WRIT 1	WRIT 2	
College 1 WRIT 26*	WRIT 1 or WRIT 1E	WRIT 2	
College 1 WRIT 25*	WRIT 26*	WRIT 1 or WRIT 1E	WRIT 2

*Indicates courses in the Multilingual Curriculum.

For more information, please visit the ELWR satisfaction website.

For more information about the Directed Self-Placement process, please visit the Directed Self-Placement website.

For a full list of Writing Program course descriptions, please visit the courses page on our website.

PHYSICAL AND BIOLOGICAL SCIENCES DIVISION

204 Natural Sciences 2 Annex
(831) 459-2931
<https://science.ucsc.edu>

A broad range of majors is offered through the physical and biological sciences. The intellectual rigor of these majors ensures that our graduates are well prepared for further studies in graduate and professional schools, as well as careers in scientific research, environmental research, medicine, law, engineering, technology, and business.

The interdisciplinary framework of the Division of Physical and Biological Sciences provides students with the opportunity to attend classes and pursue research that ranges from the study of atoms to the examination of distant galaxies, from abstract number theory to the development of new chemical compounds, or from evolution to plate tectonics. These experiences equip students not only with the skills to explore and discover the world, but also to define and improve it.

Departments and programs affiliated with the Division of Physical and Biological Sciences include the Departments of Astronomy and Astrophysics; Chemistry and Biochemistry; Earth and Planetary Sciences; Ecology and Evolutionary Biology; Microbiology and Environmental Toxicology; Mathematics; Molecular, Cell, and Developmental Biology; Ocean Sciences; Physics; and programs in Coastal Science and Policy, and Science Communication. More information about our undergraduate and graduate programs can be found on our website.

Astronomy and Astrophysics

Astronomy Department Office
269 Interdisciplinary Sciences Building
(831) 459-3081
<http://www.astro.ucsc.edu>

PROGRAMS OFFERED

Astronomy and Astrophysics Ph.D. (p. 233)

Astrophysics Minor (p. 233)

OTHER PROGRAMS OF INTEREST

Physics (Astrophysics) B.S. (p. 390)

Astronomy and astrophysics has the universe as its domain. Galaxies, stars, planets, and an ever-increasing variety of phenomena observed from ground- and space-based observatories are among the objects of study. Areas of special interest at UCSC include cosmology, the

formation and evolution of planets, stars, and galaxies, high-energy astrophysics, active galaxies, supernovae and nucleosynthesis, black holes, exoplanets, interstellar medium, intergalactic medium, solar system dynamics, Research areas include observations across a broad range of wavelengths, with a focus on the visible and infrared, the creation of new instruments and telescope technology including adaptive optics, and theory and simulation, using state-of-the-art computing resources. Astronomers use concepts from and contribute to the development of many other scientific disciplines, including optics, mechanics, relativity, atomic and nuclear physics, applied mathematics, chemistry, geology, and meteorology. The interdisciplinary nature of astronomy, including its historical and philosophical elements, makes its study valuable to those planning careers in a variety of fields.

The Department of Astronomy and Astrophysics offers an undergraduate curriculum focused on a diverse set of general education classes, intended for the broad undergraduate community. The department also offers an astrophysics minor as well as additional upper-division classes focusing on computational methods and in astrophysics.

The graduate program is intended for those with a deep interest in the subject. Students are trained in the latest techniques in computation, data analysis, and instrumentation, which have wide utility in academia and industry. The interests of the faculty embrace a wide range of theoretical, observational, and instrumentation aspects of astronomy. Current research and course offerings include our stellar structure and evolution, solar system and other planetary systems, stellar spectroscopy, the interstellar medium, galactic structure, cosmology, general relativity, gravitational radiation, the origin of the elements, optical and infrared astronomy, high-energy astrophysics, and advanced astronomical instrumentation.

Graduate students have access to state-of-the-art instrument development and data reduction technology, the UCO/Lick Observatory computer network, and an on-campus supercomputer dedicated to astrophysical computation. Graduate students may conduct supervised research using selected telescopic facilities of the Lick Observatory on Mount Hamilton, 55 miles from Santa Cruz. The 10-meter Keck Telescope in Hawaii, the world's largest, is administered from the UCSC campus and is used for frontier research by UC astronomers.

UNDERGRADUATE PROGRAM

Courses for non-majors

Instruction in astronomy for undergraduates at UC Santa Cruz is designed to meet the needs of several groups of students.

ASTR 1, ASTR 2, ASTR 3, ASTR 4, ASTR 5, ASTR 6, ASTR 7, and ASTR 8 provide a general survey of the universe as now understood from historical and modern observations, and are offered for those not specializing in a scientific discipline. ASTR 1 is a non-mathematical

introduction to the universe. ASTR 1 and ASTR 6 on exploring our solar system in the space age, satisfy the scientific inquiry (SI) general education (GE) requirement. ASTR 2 through ASTR 5 and ASTR 7 provide an introduction, with the use of basic mathematics, to a diverse array of modern astronomy, covering planets, stars, the formation of the universe, and black holes, and satisfy the mathematical and formal reasons (MF) general education requirement. ASTR 8 explores the universe with astronomical data and satisfies the statistical reasoning (SR) GE.

ASTROPHYSICS MINOR

For undergraduate students having a particular interest in the subject, a minor in astronomy and astrophysics is offered. Most students who minor in astronomy and astrophysics are majors in another science, though majors in other fields are also possible.

Course Requirements

Lower-Division Courses

Calculus:

Choose one of the following options:

Either these courses

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

or these courses

MATH 20A	Honors Calculus	5
MATH 20B	Honors Calculus	5

Advanced Calculus:

MATH 23A	Vector Calculus	5
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Physics:

Choose one of the following options:

Either these courses

PHYS 5A	Introduction to Physics I	5
PHYS 5L	Introduction to Physics I Laboratory	1
PHYS 5B	Introduction to Physics II	5
PHYS 5M	Introduction to Physics II Laboratory	1
PHYS 5C	Introduction to Physics III	5
PHYS 5N	Introduction to Physics Laboratory III	1
PHYS 5D	Introduction to Physics IV	5
or these courses		
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1

PHYS 6B	Introductory Physics II	5
PHYS 6M	Introductory Physics II Laboratory	1
PHYS 6C	Introductory Physics III	5
PHYS 6N	Introductory Physics III Laboratory	1
PHYS 5D	Introduction to Physics IV	5

Upper-Division Courses

Modern Physics:

PHYS 102	Modern Physics	5
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Four upper-division astronomy electives chosen from the following:

ASTR 111	Order-of-Magnitude Astrophysics	5
ASTR 112	Physics of Stars	5
ASTR 113	Introduction to Cosmology	5
ASTR 117	High Energy Astrophysics	5
ASTR 118	Physics of Planetary Systems	5
ASTR 119	Introduction to Scientific Computing	5
PHYS 129	Nuclear and Particle Astrophysics	5
PHYS 133	Intermediate Laboratory	5
ASTR 136	Advanced Astronomy Laboratory	5
PHYS 171	General Relativity, Black Holes, and Cosmology	5
EART 160	Planetary Science	5
EART 162	Planetary Interiors	5
EART 163	Planetary Surfaces	5
EART 164	Planetary Atmospheres	5
AM 107	Introduction to Fluid Dynamics	5

ASTRONOMY AND ASTROPHYSICS, PH.D.

Introduction

The Astronomy and Astrophysics graduate program is intended for those with a deep interest in the subject. Students are trained in the latest techniques in computation, data analysis, and instrumentation, which have wide utility in academia and in industry. The interests of the faculty embrace a wide range of both theoretical, observational, and instrumentation aspects of astronomy. Current research and course offerings include our stellar structure and evolution, solar system and other planetary systems, stellar spectroscopy, the interstellar medium, galactic structure, cosmology, general relativity, gravitational radiation, the origin of the elements, optical and infrared astronomy, high-energy astrophysics, and advanced astronomical instrumentation.

Graduate students have access to state-of-the-art instrument development and data reduction technology, the UCO/Lick Observatory computer network, and an on-campus supercomputer dedicated to astrophysical

computation. Graduate students may conduct supervised research using selected telescopic facilities of the Lick Observatory on Mount Hamilton, 55 miles from Santa Cruz. The 10-meter Keck Telescope in Hawaii, the world's largest, is administered from the UCSC campus and is used for frontier research by UC astronomers.

Advancement to Candidacy

Course Requirements

Preparation for Graduate Work in Astrophysics

The UC Santa Cruz graduate program in astronomy and astrophysics is predominantly designed for Ph.D. students seeking a professional career in research and teaching, but with flexibility for students to prepare for careers outside of academia. In view of the thorough preparation in mathematics and physics required for graduate study, most entering astronomy graduate students major in physics or astrophysics as undergraduates.

The suggested minimum requirements for admission to graduate standing at UC Santa Cruz include the following undergraduate courses:

Basic physics.

Mechanics, wave motion, sound, light, electricity and magnetism, thermodynamics, atomic physics, and quantum mechanics.

PHYS 5A	Introduction to Physics I	5
PHYS 5B	Introduction to Physics II	5
PHYS 5C	Introduction to Physics III	5
PHYS 5D	Introduction to Physics IV	5

Basic mathematics.

Calculus

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 23A	Vector Calculus	5
MATH 23B	Vector Calculus	5

or equivalent.

And Statistics

STAT 5	Statistics	5
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Intermediate-level physics.

PHYS 105	Mechanics	5
PHYS 110A	Electricity, Magnetism, and Optics	5
PHYS 110B	Electricity, Magnetism, and Optics	5
PHYS 116A	Mathematical Methods in Physics	5
PHYS 116B	Mathematical Methods in Physics	5
PHYS 116C	Mathematical Methods in Physics	5

PHYS 129	Particle Physics and Astrophysics	5
PHYS 139A	Quantum Mechanics I	5
PHYS 139B	Quantum Mechanics II	5

Intermediate-level mathematics.

MATH 21	Linear Algebra	5
MATH 103A	Complex Analysis	5
MATH 106	Systems of Ordinary Differential Equations	5
MATH 107	Partial Differential Equations	5

Graduate Program Requirements

The graduate curriculum consists of eight astronomy and astrophysics courses, including six required core courses and a choice of two elective courses. Students must additionally satisfy three equivalent educational requirements in the form of additional elective courses, research projects, independent study, or reading seminars. These requirements are detailed below.

Six courses are specifically required:

ASTR 202	Astrophysics I	5
ASTR 204	Astrophysics II	5
ASTR 205	Introduction to Astronomical Research and Teaching	5
ASTR 220A	Stars and Planets I	5
ASTR 233	Galaxies and Cosmology I	5
ASTR 257	Observational Astronomy	5

Electives

Choose two over the first two years		
ASTR 222	Stars and Planets II	5
ASTR 225	High-Energy Astrophysics	5
ASTR 230	Diffuse Matter in Space	5
ASTR 234	Statistical Techniques in Astronomy	5
ASTR 240A	Galaxies and Cosmology II	5
ASTR 260	Instrumentation for Astronomy	5
ASTR 289	Adaptive Optics and Its Application	5

Equivalent Educational Requirements

Choose three over the first two years

Equivalent educational requirements (EER) may take one of several forms, and three pre-approved options are listed below. Other EERs may be approved by the department. Students must complete three EERs during their first two years.

EER Option 1: Additional Elective Courses (5 credit course = 1 EER)

PHYS 224	Particle Astrophysics and Cosmology	5
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PHYS 226	General Relativity	5
EART 262	Planetary Interiors	5
EART 265	Order of Magnitude Estimation	5
EART 264	Planetary Atmospheres	5
AM 275	Magnetohydrodynamics	5
STAT 206	Applied Bayesian Statistics	5
AM 212A	Applied Partial Differential Equations	5
AM 214	Applied Dynamical Systems	5
AM 217	Introduction to Fluid Dynamics	5
PHYS 210	Classical Mechanics and Thermal Physics	5
PHYS 215	Introduction to Non-Relativistic Quantum Mechanics	5
PHYS 216	Advanced Topics in Non-Relativistic Quantum Mechanics	5
PHYS 217	Quantum Field Theory I	5
PHYS 218	Quantum Field Theory II	5

EER Option 2: Parallel Research Project

One quarter equals one EER.

A parallel research project is scientific research conducted in parallel to a student's thesis research, with faculty other than their primary advisor and in an area outside their primary research field. These projects will be designed to broaden the knowledge and skills of the student while increasing collaborative connections within the department, and may lead to publishable results. Each quarter students may choose from a department provided list of faculty who have available research projects designed to be completed in approximately 10 weeks. The evaluation methodology of the course will be a review by the designated faculty member of the completed research project and a write-up of the results. This option may only be taken twice in satisfaction of EERs, and may only be taken once per quarter. This option may not be taken in the fall quarter of year one.

ASTR 294	Pedagogy of Astrophysical Research	5
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EER Option 3: Reading Seminar

One quarter equals one EER.

A reading seminar is an independent study of the scientific literature or related subject matter, guided by a faculty member. Each quarter students may choose from a department-provided list of faculty who will supervise the seminar and select the course material. The goal is to broaden the knowledge of the students in a field where they do not plan to conduct active research, and a reading seminar in a student's area of research will not qualify for an EER. Students will be required to meet with the faculty member over a 10-week period to discuss the papers. The evaluation methodology for the course will

be an oral exam of the material, administered by the faculty member leading the seminar.

ASTR 294	Pedagogy of Astrophysical Research	5
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Additional Selective Coursework

Students are encouraged to leverage their opportunities for taking additional courses during their P.h.D studies at UC Santa Cruz. If students desire to supplement the coursework required for the astronomy and astrophysics degree with additional domain classes in other departments or with classes likely to advance their career goals, they can take more courses throughout their graduate career. Students should consult with their Ph.D. advisor and the graduate advisor to identify appropriate additional courses.

Additional Degree Requirements

In addition to the curriculum described above, students must fulfill the following requirements:

Students must meet at least quarterly with an assigned advisor.

Each student must also be a teaching assistant for at least two quarters. See the teaching educational requirement.

By the time of the annual board review, which occurs in July at the end of their second academic year, students must:

- Complete one quarter of master's project research with a primary UC Santa Cruz advisor and give a department talk on that work.
- Maintain a 3.0 GPA average in the six required core courses, in which students must register for an assigned grade.
- Submit one lead-author paper to a refereed journal that is based on research conducted at UC Santa Cruz. By the time of the board review, second-year students are expected to either (1) have submitted a paper for publication to a refereed journal; or (2) submit to the board review a complete first draft of such a paper and a detailed plan for completion. If the student pursues option (2), they are expected to submit the paper for publication by the first day of the fall quarter, and provide the electronic submission acknowledgement for the paper to the chair of the graduate advising committee. If the student does not complete this requirement, they will meet with their advisor, the graduate advising committee chair, and the department chair before the first faculty meeting of the fall quarter, in order to discuss the status of the paper. The faculty at that meeting will then make a recommendation whether the student should be granted an extension to the next board review, and the full faculty will then vote on whether to grant an extension.

After passing the board review based on the above-mentioned requirements and the qualifying examination, students pursue independent research leading to the doctoral dissertation.

Foreign Language Requirements

Teaching Requirements

During their Ph.D. studies, graduate students in UC Santa Cruz astronomy and astrophysics will gain formative experience teaching undergraduate students, usually through teaching assistantships (TAs) in collaboration with department faculty.

- Students will serve as an official TA for at least two academic year quarters during their Ph.D. studies. One quarter must be during the first two years of Ph.D. studies. The remainder of this teaching educational requirement must be satisfied before receiving a doctorate degree.
- The teaching education requirement applies to all students, including those with external fellowships or other forms of support.
- The department may require students to serve as a TA for more than two quarters as a condition of the student's financial support during their Ph.D. studies.

Pre-Qualifying Requirements

Qualifying Examination

By the end of the third year, students must complete a qualifying examination that presents and defends a proposed thesis topic.

Post-Qualifying Requirements

Degree Timeline and Funding

The department has established five years as the normative time to degree. Normative time is the elapsed calendar time, in years, that, under normal circumstances and excluding department-approved leaves, will be needed to complete all requirements for the Ph.D.

We expect funding in the form of graduate student researcher positions or teaching assistantships to be available for our Ph.D. students for five years, provided the student makes sufficient progress toward a degree. A one-year extension may be granted if funding is available. Funding support will not, in general, be provided beyond six years. Exceptions for extension beyond six years will be granted only for exceptional extenuating circumstances, and will be decided upon by the department chair, associate chair, and the department graduate advising committee.

Dissertation

Dissertation

After passing the board review based on the above-mentioned requirements and the qualifying examination, students pursue independent research leading to the doctoral dissertation.

Dissertation Defense

Upon completion of the Ph.D. dissertation, students must pass an oral dissertation defense. A completed draft of the thesis must be submitted to the dissertation committee at least two weeks before the date of the defense, and the defense itself must occur at least two weeks before the campus deadline for thesis submissions in that quarter. Exceptions to this policy will be granted only under exceptional circumstances and must be approved by the department chair, associate chair, and the department graduate advising committee.

Academic Progress

The department has established five years as the normative time to degree. Normative time is the elapsed calendar time, in years, that, under normal circumstances and excluding department-approved leaves, will be needed to complete all requirements for the Ph.D.

We expect funding in the form of graduate student researcher positions or teaching assistantships to be available for our PhD students for five years, provided the student makes sufficient progress towards a degree. A one-year extension may be granted if funding is available. Funding support will not, in general, be provided beyond six years. Exceptions for extension beyond six years will be granted only for exceptional extenuating circumstances, and will be decided upon by the department chair, associate chair, and the department graduate advising committee.

Applying for Graduation

[Optional Catchall]

Chemistry and Biochemistry

Chemistry and Biochemistry Department
230 Physical Sciences Building
(831) 459-4125
<https://www.chemistry.ucsc.edu/>

PROGRAMS OFFERED

Chemistry B.A. (p. 238)

Chemistry B.S. (p. 243)

Biochemistry and Molecular Biology B.S.

Chemistry Minor (p. 256)

Chemistry M.S. (p. 258)

Chemistry Ph.D. (p. 258)

OTHER PROGRAMS OF INTEREST

Science Education B.S. (p. 398)

Chemistry is central to modern science. Ultimately, most phenomena in biology, medicine, materials, engineering, geology, and the environmental sciences can be described in terms of the chemical and physical behavior of atoms and molecules. Because of the wide appeal and utility of chemistry, UC Santa Cruz offers comprehensive lower-division courses in introductory and organic chemistry, differing in emphasis and style, to meet diverse needs. Students should also note the numerous upper-division course offerings and select those most suitable to their academic interests. The curriculum in chemistry exposes the student to the principal areas of modern chemistry, including organic, inorganic, physical, materials, analytical, and biochemistry. The curriculum is designed to meet the needs of students who plan to graduate with a bachelor of arts (B.A.) or bachelor of science (B.S.) degree, as well as those who wish to pursue an advanced degree. The UCSC chemistry B.A. or B.S. graduate is well prepared to pursue a career in chemistry or related field.

Research in chemistry at UCSC is closely interwoven with graduate and undergraduate education. The chemistry and biochemistry research program is highly active at the graduate level, and faculty also encourage undergraduates to become involved in research. Research leads to academic credit in Senior Thesis (CHEM 195A, CHEM 195B, CHEM 195C) or Senior Research (CHEM 199). There are also opportunities for interdisciplinary research combining chemistry with a wide range of sciences, for example, biology, physics, geology, ocean sciences, microbiology and environmental toxicology. At UCSC, it is not uncommon for students to become co-authors of original work published in research journals.

Chemistry and biochemistry faculty and approximately 100 graduate students and 15-20 postdoctoral fellows are housed in the Physical Sciences Building near the Science and Engineering Library. The department maintains and constantly expands cutting-edge facilities (such as the Chemical Screening Center, Macromolecular Structure Function Core Facility, Mass Spectrometry, NMR Facility, and X-Ray Facility) that enable scientists to carry out their research

The Science and Engineering Library has an excellent collection of current journals and reference works, as well as access to earlier volumes of all the major journals. Many of these are subscribed to online. Additional source material can be readily and rapidly obtained on interlibrary loan.

UNDERGRADUATE PROGRAM

A degree in chemistry opens the door to a wide variety of academic careers. Some UC Santa Cruz graduates are working as industry researchers in electronic materials,

biotechnology, medicinal chemistry, pharmacy, or laser technology. Others have entered government service as research chemists in the Food and Drug Administration, the Environmental Protection Agency, DOD, DOE or law enforcement crime laboratories. Fields such as patent law, commercial development, and scientific writing are open to graduates. Many chemistry majors go on to university graduate programs across the nation to prepare for careers in academia, government, or industry. The degree in chemistry also provides a strong disciplinary background in preparation for a career in the important and much needed area of science teaching in high school. A major in chemistry is also an excellent beginning for one of the many opportunities in the health sciences.

The UCSC Chemistry and Biochemistry Department offers both B.S. and B.A. degree programs. The B.S. degree should be the choice if a student is interested in getting a job in industry immediately after receiving his or her college degree. The B.S. program also provides a good background for graduate work in chemistry. The B.A. program has fewer requirements and should be considered by students who wish to take more science courses outside of chemistry to enter an interdisciplinary area. Examples might be chemical oceanography, geochemistry, chemical physics, environmental chemistry, or health sciences. The B.A. might also be a good choice for students who wish to become high school teachers. For either degree, the courses stress the fundamentals of chemistry and allow students to pursue independent research.

A minor in chemistry is also offered for those who wish to have a strong complementary program in chemistry while majoring in another area of study.

GRADUATE PROGRAM

The Department of Chemistry and Biochemistry offers three graduate degrees: the Doctor of Philosophy (Ph.D.), a thesis Master of Science (M.S.), and a coursework M.S. The Ph.D. and thesis M.S. programs are designed to help students develop into independent scholars while pursuing the excitement of scientific research in a personal, supportive environment. Both the Ph.D. and the research M.S. programs prepare students for careers in academia, industry, government laboratories, and other settings requiring an advanced education in chemistry and related disciplines. The coursework M.S. does not require research and is suited to future teachers and others wishing to update or broaden their chemical expertise. Approximately 100 graduate students are currently enrolled in the graduate program.

The Department of Chemistry and Biochemistry invites well-known researchers from outside UC Santa Cruz to share and discuss their current research. Visiting speakers from other universities and government or industrial research labs expose students to advances at the frontiers of chemical research, offering the opportunity for personal contact with leading scientists. All Ph.D. and thesis M.S. students are required to enroll in the CHEM

291, Research Seminar, until they have advanced to candidacy.

Teaching assistantships provide both financial support and the opportunity to put into practice the required pedagogical training offered in CHEM 296 (presentation techniques, discussion strategies, laboratory teaching skills, laboratory safety procedures, and time management). Doctoral students may also be supported as graduate-student researchers.

CHEMISTRY B.A.

Information and Policies

The requirements for the bachelor of arts (B.A.) in chemistry have been kept to a minimum so that students may tailor their program to their own purposes, for example, to pursue a double major, to complete major requirements late in their college career, or to concentrate on a specific branch of chemistry. The minimum requirements (including prerequisites) constitute 54 percent of a student's total undergraduate program; consequently, there is ample time to explore and discover other interests within the university. To plan wisely, students are advised to refer to each course description for a detailed listing of prerequisites. Students who decide they want a professional career in chemistry are advised to meet with the chemistry undergraduate faculty advisor.

Introduction

Academic Advising for the Program

The chemistry and biochemistry advisors provide counsel to undergraduate majors. Students are encouraged to seek out advising and assistance in planning their academic careers to ensure completion of their major in a timely manner. For assistance, please contact Chemistry Advising at chemistryadvising@ucsc.edu or visit our department website. Transfer students should also consult the Transfer Information and Policy Section below.

Getting Started in the Major

High School Preparation

Prospective chemistry majors should have a solid foundation in high school mathematics; familiarity with algebra, logarithms, trigonometry, and analytic geometry is particularly required. Students taking chemistry at UCSC begin with CHEM 1A or CHEM 1B, both of which require a strong background in high school chemistry.

Prerequisites

In order to determine what preparation may be needed to succeed in the general chemistry sequence, CHEM 1A, CHEM 1B, and CHEM 1C, students are encouraged to take the Chemistry Self-Assessment Examination.

Program Learning Outcomes

Learning outcomes summarize the most important knowledge, skills, abilities, and attitudes that students are expected to develop over the course of their studies.

The program learning outcomes clearly communicate the faculty's expectations to students, provide a framework for faculty evaluation of the curriculum based on empirical data, and help improve and measure the impact of implemented changes.

Students graduating with a B.A. in chemistry should be able to:

- demonstrate mastery of a broad set of chemical knowledge concerning the fundamentals in the basic areas of the discipline (organic, inorganic, and physical chemistry);
- solve area-specific problems by identifying the essential parts of a problem, formulating a strategy for solving the problem, applying appropriate techniques to arrive at a solution, testing the correctness of the solution, and interpreting their results;
- use modern library search tools (such as SciFinder, PubMed, or Web of Science) to locate and retrieve scientific information about a topic, chemical, chemical technique, or an issue relating to chemistry;
- know and follow the proper procedures and regulations for safe handling and use of chemicals;
- understand the objective of their chemical experiments, properly carry out the experiments, and appropriately record and analyze the results;
- use computers in data acquisition and processing, and use available software as a tool in data analysis;
- use standard laboratory equipment, modern instrumentation, and classical techniques to carry out experiments;
- communicate the concepts and results of their laboratory experiments through effective writing and/or oral communication using the discipline standards for reporting and citation; and
- collaborate effectively as part of a team to solve problems, debate different points of view, and interact productively with a diverse group of team members.

Major Qualification Policy and Declaration

Process

Major Qualification

Students must complete the following qualification courses, or their equivalents, each with a grade of C (2.0) or better and with a cumulative grade point average (GPA) of 2.50 or greater in these six required courses:

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1C	General Chemistry	5

Plus one of the following options:

Either these courses

MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5

or these courses

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

And one of the following options:

MATH 22	Introduction to Calculus of Several Variables	5
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or this course

MATH 23A	Vector Calculus	5
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or this course

AM 30	Multivariate Calculus for Engineers	5
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Determining qualification for the major

When determining qualification to declare the major:

- All courses must be taken for a letter grade.

- For courses required to qualify for the major that have been satisfied with AP credit based on an AP examination score of 5 (for CHEM 1A), and an AP Calculus BC examination score of 4 or 5 (for MATH 11A or MATH 19A), students may substitute a grade of A for each course when calculating their cumulative GPA.

- Students with two or more grades of NP, C-, D+, D, D-, or F in courses required to qualify for the major are not eligible to declare.

Transfer students should also consult the Transfer Information and Policy Section below.

Appeal Process

Students may appeal to the major either prior to OR after submitting a petition to declare and being denied (in the latter case, appeals must be submitted within 15 days from the date the denial notification was sent).

To appeal to declare a Chemistry major, submit a letter to the chemistry advisor, chemistryadvising@ucsc.edu.

Within 15 days of receipt of the appeal, the department will notify the student and their affiliated college of the decision. For more information about the appeal process, see the Appeal Process on the Chemistry website.

How to Declare a Major

You may declare a major as early as you would like if you have decided which major to pursue and have satisfied prerequisites or qualification requirements (if any) for the major. Students should submit a petition to declare as soon as they complete the major qualification requirements or reach their declaration deadline quarter (whichever comes first).

Students who enter UC Santa Cruz as frosh are required to formally petition to declare a major by the campus deadline in their sixth quarter and before enrolling in their third year (or equivalent). Upper-division transfer students are required to be declared in a major by the deadline in their second term at UCSC.

Each major/minor advising office has a process for declaring. To initiate the process to declare, please complete the online declaration petition located on the Chemistry and Biochemistry Department website. For assistance, please contact Chemistry Advising at chemistryadvising@ucsc.edu.

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed major qualification courses.

Transfer Information and Policy

Transfer Admission Screening Policy

The following courses or their equivalents are required prior to transfer, by the end of the spring term for students planning to enter in the fall.

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1C	General Chemistry	5
MATH 22	Introduction to Calculus of Several Variables	5

Plus one of the following options:

Either these courses

MATH 11A	Calculus with Applications	5
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MATH 11B	Calculus with Applications	5
or these courses		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

In addition, the following courses are recommended prior to transfer to ensure timely graduation:

CHEM 8A	Organic Chemistry	5
CHEM 8L	Organic Chemistry Laboratory	2
CHEM 8B	Organic Chemistry	5
CHEM 8M	Organic Chemistry Laboratory	2
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 6B	Introductory Physics II	5
PHYS 6M	Introductory Physics II Laboratory	1

Getting Started at UCSC as a Transfer Student

Transfer students are highly encouraged to meet with the chemistry academic advisor in their first quarter. For assistance with advising, please contact Chemistry Advising at chemistryadvising@ucsc.edu. More information specific to transfer students may also be found on our department website.

Students who have satisfied the screening requirements can declare their major any time after coming to UC Santa Cruz but are required to be declared in a major by the applicable deadline; in their second term at UCSC for students entering at the junior level.

Transfer students who are proposed in a different major (other than chemistry) and have advanced standing when they come to UC Santa Cruz require permission from the department to change into the major. Admission to the major is not guaranteed. For more information on qualifying for the major as a transfer applicant, see the Transfer Students webpage.

Letter Grade Policy

For all students entering UCSC in fall 2001 and later, all courses used to satisfy degree requirements in any of the chemistry and biochemistry majors must be taken for a letter grade. Additionally, letter grades of C or higher must be attained to meet major and minor requirements for graduation.

[Optional Catchall]

Course Substitution Policy

At least half of the upper-division courses (CHEM 100–CHEM 199) required for any chemistry major must be taken through the chemistry program at UCSC, not as transfer credits from another department or institution. Transfer students are advised to contact a department undergraduate advisor before enrolling in any upper-division courses at other institutions to verify articulation. For more information on transferring courses to UCSC, please consult the Transfer Preparation website.

CHEM 199, Independent Study Course, may not be taken more than once per quarter and may be repeated no more than three times during an undergraduate career.

Double Majors and Major/Minor Combinations Policy

Study Abroad

Honors

To receive honors in the chemistry major, a GPA of 3.5 or higher is required in all chemistry courses; highest honors requires a 3.8 or higher GPA in all chemistry courses for the major. Students may also receive honors for a senior research thesis.

Materials Fee

Chemistry students should be aware of the materials fee required for some courses. The fee is billed to the student's account for specific laboratory materials purchased by the Chemistry and Biochemistry Department through the university. Fees generally range from \$18 to \$75 per course. Students may incur additional expenses for individual supplies.

Program for Students of the Health Sciences

Students intending to enter medical, dental, or another health science professional school can satisfy entrance requirements with a major program in chemistry supplemented with further courses, especially in biology, as specified by the admissions requirements of the school where they intend to apply. Students are urged to contact the Career Center for assistance with the application process.

[Optional Catchall]

Requirements and Planners

Course Requirements

Lower-Division Courses

General Chemistry:

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1M	General Chemistry Laboratory	2

CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2

Calculus:

Choose one of the following options:

Either these courses		
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5
or these courses		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

A student may combine the MATH 11 series with the MATH 19 series to complete this portion of the major requirement(s). For example, a student can take and complete MATH 19A and then take and complete MATH 11B.

Multivariable Calculus:

Either this course		
MATH 22	Introduction to Calculus of Several Variables	5
or these courses		
MATH 23A	Vector Calculus	5
MATH 23B	Vector Calculus	5
or this course		
AM 30	Multivariate Calculus for Engineers	5

Physics:

Choose one of the following options:

Either these courses		
PHYS 5A	Introduction to Physics I	5
PHYS 5L	Introduction to Physics I Laboratory	1
PHYS 5B	Introduction to Physics II	5
PHYS 5M	Introduction to Physics II Laboratory	1
PHYS 5C	Introduction to Physics III	5
PHYS 5N	Introduction to Physics Laboratory III	1
or these courses		
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 6B	Introductory Physics II	5
PHYS 6M	Introductory Physics II Laboratory	1

PHYS 6C	Introductory Physics III	5
PHYS 6N	Introductory Physics III Laboratory	1

A student may combine the PHYS 5 series with the PHYS 6 series to complete this portion of the major requirement(s). For example, a student can take and complete PHYS 5A and PHYS 5L and then take and complete PHYS 6B and 6M and PHYS 6C and 6N.

Organic Chemistry:

CHEM 8A	Organic Chemistry	5
CHEM 8L	Organic Chemistry Laboratory	2
CHEM 8B	Organic Chemistry	5
CHEM 8M	Organic Chemistry Laboratory	2

Upper-Division Courses**Intermediate Organic Chemistry:**

CHEM 110	Intermediate Organic Chemistry with Emphasis on Synthesis and Analytical Methods	5
CHEM 110L	Intermediate Organic Chemistry Laboratory	2

Inorganic Chemistry:

CHEM 151A	Chemistry of Metals	5
CHEM 151L	Inorganic Chemistry Laboratory	2

Physical Chemistry:

CHEM 163A	Quantum Mechanics and Basic Spectroscopy	5
CHEM 163B	Chemical Thermodynamics	5
CHEM 164	Physical Chemistry Laboratory	5

A student may combine the CHEM 163 series with the BIOC 163 series to complete this portion of the major requirement(s). For example, a student can take and complete CHEM 163A and then take and complete BIOC 163B.

One of the following laboratory courses:

CHEM 146A	Advanced Laboratory in Organic Chemistry	3
CHEM 146B	Advanced Laboratory in Inorganic Chemistry	3
CHEM 146C	Advanced Laboratory in Physical Chemistry	3

Students currently conducting senior thesis research are strongly encouraged to choose an advanced laboratory in the CHEM 146 series that is outside their research area.

Electives

At least two from the following:

BIOC 100A	Biochemistry and Molecular Biology	5
CHEM 103	Biochemistry	5
CHEM 143	Organic Chemical Structure and Reactions	5
CHEM 144	Catalysis In Organic Synthesis Using Metals and Metalloids Based Reagents	5
CHEM 151B	Chemistry of the Main Group Elements	5
CHEM 156C	Materials Chemistry	5
CHEM 163C	Statistical Thermodynamics and Kinetics	5
CHEM 169	Chemistry and Biology of Drug Design and Discovery	5
CHEM 194	Senior Essay	5
METX 101	Sources and Fates of Pollutants	5
METX 102	Cell and Molecular Toxicology	5
OCEA 120	Aquatic Chemistry: Principles and Applications	5
OCEA 121	Aqueous Geochemistry	5
PHYS 180	Biophysics	5

Students cannot receive elective credit toward the major for both BIOC 100A and CHEM 103. Students may also satisfy the elective requirement by completing a chemistry graduate course with the permission of the instructor and department. Please consult with a department undergraduate advisor prior to enrolling.

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) Requirement. The DC Requirement for the bachelor of arts degree in chemistry is satisfied by completing:

CHEM 151L	Inorganic Chemistry Laboratory	2
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Plus one of the following courses:

CHEM 146A	Advanced Laboratory in Organic Chemistry	3
CHEM 146B	Advanced Laboratory in Inorganic Chemistry	3
CHEM 146C	Advanced Laboratory in Physical Chemistry	3

Comprehensive Requirement

The comprehensive requirement is a part of all UCSC degrees. For the Chemistry B.S., this requirement can be satisfied by receiving a passing grade in the upper-division labs listed below. These courses provide modern, individualized training in the discipline thus serving as relevant capstone experiences.

CHEM 151L	Inorganic Chemistry Laboratory	2
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Plus one of the following courses:

CHEM 146A	Advanced Laboratory in Organic Chemistry	3
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CHEM 146B	Advanced Laboratory in Inorganic Chemistry	3
CHEM 146C	Advanced Laboratory in Physical Chemistry	3

Planners

This is the ideal academic plan for chemistry B.A. majors. If needed, the plan can be arranged differently. Please see an academic advisor in the Chemistry Department to create your specific official academic plan.

	Fall	Winter	Spring
1st (frosh)	MATH 19A or MATH 11A	MATH 19B or MATH 11B	CHEM 1C & CHEM 1N
	CHEM 1A	CHEM 1B & CHEM 1M	
2nd (soph)	CHEM 8A & CHEM 8L	CHEM 8B & CHEM 8M	CHEM 110 & CHEM 110L
	PHYS 6A & PHYS 6L	MATH 22	PHYS 6B & PHYS 6M
3rd (junior)	CHEM 163A	CHEM 163B	CHEM elective
	PHYS 6C & PHYS 6N	CHEM 151A & CHEM 151L	
4th (senior)	CHEM elective or CHEM 146 Lab	CHEM 164	CHEM elective or CHEM 146 Lab

Two of the required general education requirements will be fulfilled by the major requirements listed in the above planner (MF & SI). In addition to the specific courses shown in these planners, a student will also need to complete courses satisfying the following general education requirements: Cross-Cultural Analysis, Ethnicity & Race, Interpreting Arts & Media, Statistical Reasoning, Textual Analysis & Interpretation, Perspectives, and Practice.

Sample Transfer Two-Year Planner

This is the ideal planner for students who have transferred in with both the required and the highly recommended courses. **Note:** Failure to complete both the required and highly recommended courses prior to transfer may require additional time to degree. Please refer to the following academic planners that detail student plans with only the minimum transfer requirements completed. Please see an academic advisor in the Chemistry Department to create your specific official academic plan

	Fall	Winter	Spring
1st (junior)	CHEM 163A	CHEM 163B	CHEM 110 & CHEM 110L
	PHYS 6C & PHYS 6N	CHEM 151A & CHEM 151L	
2nd (senior)	CHEM elective or CHEM 146 Lab	CHEM 164	CHEM elective or CHEM 146 Lab

Required Courses prior to transfer:

- General chemistry (full sequence with lab) CHEM 1A, CHEM 1B & CHEM 1M and CHEM 1C & CHEM 1N
- Single variable calculus (full sequence) MATH 11A, MATH 11B
- Multivariable calculus (one-semester course) MATH 22

Highly Recommended Courses prior to transfer:

- Organic chemistry (full sequence with lab) CHEM 8A & CHEM 8L, CHEM 8B & CHEM 8M
- Calculus-based physics PHYS 6A & PHYS 6L, PHYS 6B & PHYS 6M

CHEMISTRY B.S.

Information and Policies

Introduction

The bachelor of science major program is designed for students who intend to pursue a professional career in chemistry. It is rigorous and broadly based, appropriate for that purpose.

Academic Advising for the Program

The chemistry and biochemistry advisors provide counsel to undergraduate majors. Students are encouraged to seek out advising and assistance in planning their academic careers to ensure completion of their major on time. For assistance, please contact Chemistry Advising at chemistryadvising@ucsc.edu or visit our department website. Transfer students should also consult the Transfer Information and Policy Section below.

Getting Started in the Major

High School Preparation

Prospective chemistry majors should have a solid foundation in high school mathematics; familiarity with algebra, logarithms, trigonometry, and analytic geometry is particularly required. Students taking chemistry at UCSC begin with CHEM 1A or CHEM 1B, both of which require a strong background in high school chemistry.

Prerequisites

To determine what preparation may be needed to succeed in the general chemistry sequence, CHEM 1A, CHEM 1B, and CHEM 1C, students are encouraged to take the Chemistry Self-Assessment Examination.

Program Learning Outcomes

Learning outcomes summarize the most important knowledge, skills, abilities, and attitudes that students are expected to develop throughout their studies.

The program learning outcomes communicate the faculty's expectations to students, provide a framework for faculty evaluation of the curriculum based on empirical data, and help improve and measure the impact of implemented changes.

Students graduating with a B.S. in chemistry should be able to:

- demonstrate mastery of a broad set of chemical knowledge concerning the fundamentals in the basic areas of the discipline (organic, inorganic, analytical, physical, and biochemistry);
- solve area-specific problems by identifying the essential parts of a problem, formulating a strategy for solving the problem, applying appropriate techniques to arrive at a solution, testing the correctness of the solution, and interpreting their results;
- use modern library search tools (such as SciFinder, PubMed, or Web of Science) to locate and retrieve scientific information about a topic, chemical, chemical technique, or an issue relating to chemistry;
- know and follow the proper procedures and regulations for

safe handling and use of chemicals;

- understand the objective of their chemical experiments, properly carry out the experiments, and appropriately record and analyze the results;
- use computers in data acquisition and processing, and use available software as a tool in data analysis;
- use standard laboratory equipment, modern instrumentation, and classical techniques to carry out experiments;
- communicate the concepts and results of their laboratory experiments through effective writing and/or oral communication using the discipline standards for reporting and citation; and
- collaborate effectively as part of a team to solve problems, debate different points of view, and interact productively with a diverse group of team members.

Major Qualification Policy and Declaration Process

Major Qualification

Students must complete the following six qualification courses, or their equivalents, each with a grade of C (2.0) or better and with a cumulative grade point average (GPA) of 2.50 or greater in these six required courses:

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1C	General Chemistry	5

Plus one of the following options:

Either these courses

MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5

or these courses

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

And one of the following options:

Either this course

MATH 22	Introduction to Calculus of Several Variables	5
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or this course

MATH 23A	Vector Calculus	5
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or this course

AM 30	Multivariate Calculus for Engineers	5
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Determining qualification for the major

When determining qualification to declare the major:

- All courses must be taken for a letter grade.
 - For courses required to qualify for the major that have been satisfied with advanced placement (AP) credit based on an AP examination score (See Admissions AP Chart), students may substitute a grade of A for each course when calculating their GPA.
 - Students with two or more grades of NP, C-, D+, D, D-, or F in courses required to qualify for the major are not eligible to declare.
- Transfer students should also consult the Transfer Information and Policy Section below.

Appeal Process

Students may appeal to the major either prior to **OR** after submitting a petition to declare and being denied (in the latter case, appeals must be submitted within 15 days from the date the denial notification was sent).

To appeal to declare a chemistry major, submit a letter to the chemistry advisor, chemistryadvising@ucsc.edu.

Within 15 days of receipt of the appeal, the department will notify the student and their affiliated college of the decision. For more information about the appeal process, see the Appeal Process on the Chemistry website.

How to Declare a Major

You may declare a major as early as you would like if you have decided which major to pursue and have satisfied prerequisites or qualification requirements (if any) for the major. Students should submit a petition to declare as soon as they complete the major qualification requirements or reach their declaration deadline quarter (whichever comes first).

Students who enter UC Santa Cruz as frosh are required to formally petition to declare a major by the campus deadline in their 6th quarter and before enrolling in their third year (or equivalent). Upper-division transfer students are required to be declared in a major by the deadline in their second term at UCSC.

Each major/minor advising office has a process for declaring. To initiate the process to declare, please complete the online declaration petition located on the Department of Chemistry website. For assistance, please contact chemistry advising at chemistryadvising@ucsc.edu.

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed major qualification courses.

Transfer Information and Policy

Transfer Admission Screening Policy

The following courses or their equivalents are required before the transfer, by the end of the spring term for students planning to enter in the fall.

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1C	General Chemistry	5
MATH 22	Introduction to Calculus of Several Variables	5

Plus one of the following options:

Either these courses

MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5

or these courses

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

Students must complete the above courses or their equivalents, with a grade of C or better, *and* have a cumulative GPA in these courses of 2.5 or greater.

In addition, the following courses are recommended prior to transfer to ensure timely graduation:

CHEM 8A	Organic Chemistry	5
CHEM 8L	Organic Chemistry Laboratory	2
CHEM 8B	Organic Chemistry	5
CHEM 8M	Organic Chemistry Laboratory	2
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 6B	Introductory Physics II	5
PHYS 6M	Introductory Physics II Laboratory	1

Getting Started at UCSC as a Transfer Student

Transfer students are highly encouraged to meet with the chemistry academic advisor in their first quarter. For assistance with advising, please contact chemistry advising at chemistryadvising@ucsc.edu. More

information specific to transfer students may also be found on our department website.

Students who have satisfied the screening requirements can declare their major any time after coming to UCSC but are required to be declared in a major by the applicable deadline; in their second term at UCSC for students entering at the junior level.

Transfer students who are proposed in a different major (other than chemistry) and have advanced standing when they come to UC Santa Cruz require permission from the department to change into the major. Admission to the major is not guaranteed. For more information on qualifying for the major as a transfer applicant, see the Transfer Students webpage.

Letter Grade Policy

For all students entering UCSC in fall 2001 and later, all courses used to satisfy degree requirements in any of the chemistry and biochemistry majors, must be taken for a letter grade. Additionally, letter grades of C or higher must be attained to meet major and minor requirements for graduation.

[Optional Catchall]

Course Substitution Policy

At least half of the upper-division courses (CHEM 100–CHEM 199) required for any chemistry major must be taken through the chemistry program at UCSC, not as transfer credits from another department or institution. Transfer students are advised to contact a department undergraduate advisor before enrolling in any upper-division courses at other institutions to verify articulation. For more information on transferring courses to UCSC, please consult the Transfer Preparation website.

CHEM 199, Senior Research: Independent Research in the Lab, may not be taken more than once per quarter and may be repeated no more than three times during an undergraduate career.

Double Majors and Major/Minor Combinations Policy

Study Abroad

Honors

To receive honors in the chemistry major, a GPA of 3.5 or higher is required in all chemistry courses; highest honors requires a 3.8 or higher GPA in all chemistry courses for the major. Students may also receive honors for a senior research thesis.

Materials Fee

Chemistry students should be aware of the materials fee required for some courses. The fee is billed to the student's account for specific laboratory materials purchased by the Chemistry and Biochemistry Department through the university. Fees generally range

from \$18 to \$75 per course. Students may incur additional expenses for individual supplies.

Program for Students of the Health Sciences

Students intending to enter medical, dental, or another health science professional school can satisfy entrance requirements with a major program in chemistry supplemented with further courses, especially in biology, as specified by the admissions requirements of the school where they intend to apply. Students are urged to contact the Career Center for assistance with the application process.

American Chemical Society Certification

The American Chemical Society (ACS) recognizes certain undergraduate programs, including those of UCSC, to be of such quality as to entitle graduates to become ACS members immediately upon graduation. Graduates must be individually certified to the ACS by the Chemistry and Biochemistry Department chair if they have satisfactorily completed an approved program of study. ACS certification standards are rigorous; a graduate who has met them carries a distinction that is well recognized in the profession. Broadly speaking, ACS certification requirements are satisfied by completing CHEM 122 as an elective and graduating with a Chemistry B.S. (biochemistry concentration excluded). A year of study in a major modern foreign language is recommended. More information is available from the Chemistry and Biochemistry undergraduate advisor.

[Optional Catchall]

General B.S. Degree

Course Requirements

The Bachelor of Science (B.S.) major program is designed for students who intend to pursue a professional career in chemistry. It is rigorous and broadly based. The course requirements for the B.S. major are as follows; please refer to each course description for a detailed listing of prerequisites.

Lower-Division Courses

General Chemistry:

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1M	General Chemistry Laboratory	2
CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2

Calculus:

Choose one of the following options:

Either these courses		
MATH 11A	Calculus with Applications	5

MATH 11B	Calculus with Applications	5
or these courses		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

A student may combine the MATH 11 series with the MATH 19 series to complete this portion of the major requirement(s). For example, a student can take and complete MATH 19A and then take and complete MATH 11B.

Multivariable Calculus:

Choose one of the following options:

Either this course		
MATH 22	Introduction to Calculus of Several Variables	5
or these courses		
MATH 23A	Vector Calculus	5
MATH 23B	Vector Calculus	5
or this course		
AM 30	Multivariate Calculus for Engineers	5

Advanced Mathematics:

Choose one of the following courses:

AM 10	Mathematical Methods for Engineers I	5
MATH 21	Linear Algebra	5
MATH 24	Ordinary Differential Equations	5

Physics:

Choose one of the following options:

Either these courses		
PHYS 5A	Introduction to Physics I	5
PHYS 5L	Introduction to Physics I Laboratory	1
PHYS 5B	Introduction to Physics II	5
PHYS 5M	Introduction to Physics II Laboratory	1
PHYS 5C	Introduction to Physics III	5
PHYS 5N	Introduction to Physics III Laboratory	1
or these courses		
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 6B	Introductory Physics II	5
PHYS 6M	Introductory Physics II Laboratory	1

PHYS 6C	Introductory Physics III	5
PHYS 6N	Introductory Physics III Laboratory	1

A student may combine the PHYS 5 series with the PHYS 6 series to complete this portion of the major requirement(s). For example, a student can take and complete PHYS 5A and PHYS 5L and then take and complete PHYS 6B and PHYS 6M and PHYS 6C and PHYS 6N.

Organic Chemistry:

CHEM 8A	Organic Chemistry	5
CHEM 8L	Organic Chemistry Laboratory	2
CHEM 8B	Organic Chemistry	5
CHEM 8M	Organic Chemistry Laboratory	2

By permission and invitation of the instructor, students may substitute CHEM 8M with CHEM 8N, Honors Organic Chemistry Lab. This course is designed to introduce the exceptional student to many of the techniques associated with organic chemistry while taking part in an active organic chemistry research experience.

Upper-Division Courses

Intermediate Organic Chemistry:

CHEM 110	Intermediate Organic Chemistry with Emphasis on Synthesis and Analytical Methods	5
CHEM 110L	Intermediate Organic Chemistry Laboratory	2

By permission and invitation of the instructor, students may substitute CHEM 110L with CHEM 110N, Honors Organic Chemistry Lab. This course is designed to introduce the exceptional student to many of the techniques associated with organic chemistry while taking part in an active organic chemistry research experience.

Inorganic Chemistry:

CHEM 151A	Chemistry of Metals	5
CHEM 151L	Inorganic Chemistry Laboratory	2

Biochemistry:

CHEM 103	Biochemistry	5
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Physical Chemistry:

CHEM 163A	Quantum Mechanics and Basic Spectroscopy	5
CHEM 163B	Chemical Thermodynamics	5
CHEM 163C	Statistical Thermodynamics and Kinetics	5
CHEM 164	Physical Chemistry Laboratory	5

One of the following laboratory courses:

CHEM 146A	Advanced Laboratory in Organic Chemistry	3
CHEM 146B	Advanced Laboratory in Inorganic Chemistry	3
CHEM 146C	Advanced Laboratory in Physical Chemistry	3

Students currently conducting senior thesis research are strongly encouraged to choose an advanced laboratory in the CHEM 146 series that is outside their research area.

Electives

At least two from the following list:

CHEM 122	Principles of Instrumental Analysis	5
CHEM 143	Organic Chemical Structure and Reactions	5
CHEM 144	Catalysis In Organic Synthesis Using Metals and Metalloids Based Reagents	5
CHEM 151B	Chemistry of the Main Group Elements	5
CHEM 156C	Materials Chemistry	5
CHEM 169	Chemistry and Biology of Drug Design and Discovery	5
CHEM 171	Chemical Biology	5
BIOC 100C	Biochemistry and Molecular Biology	5
METX 101	Sources and Fates of Pollutants	5
METX 102	Cell and Molecular Toxicology	5
OCEA 120	Aquatic Chemistry: Principles and Applications	5
OCEA 121	Aqueous Geochemistry	5
PHYS 180	Biophysics	5

To receive certification from the American Chemical Society, you must complete CHEM 122.

BIOC 100A, BIOC 100B, BIOC 100C: Students who plan to do advanced work in biochemistry and molecular biology should take the Biochemistry and Molecular Biology (BIOC) 100 series. Completing the series will fulfill the requirement of CHEM 103 (Biochemistry) plus fulfill one elective. CHEM 103 is equivalent to BIOC 100A and BIOC 100B. Students can enroll in BIOC 100C once CHEM 103 is completed.

Students may also satisfy the elective requirement by completing a Chemistry Graduate Course with permission from the instructor and department. Please consult with a department undergraduate advisor before enrolling.

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) Requirement.

The DC Requirement for the Bachelor of Science (B.S.) degree in chemistry is satisfied by completing:

CHEM 151L	Inorganic Chemistry Laboratory	2
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Plus one of the following courses:

CHEM 146A	Advanced Laboratory in Organic Chemistry	3
CHEM 146B	Advanced Laboratory in Inorganic Chemistry	3
CHEM 146C	Advanced Laboratory in Physical Chemistry	3

3rd (junior)	CHEM 163A	CHEM 163B	CHEM 163C
	PHYS 6C & 6N	CHEM 151A & 151L	CHEM 103
4th(senior)	CHEM 146**	CHEM 164	CHEM elective
	CHEM elective		

Comprehensive Requirement

The comprehensive requirement is a part of all UCSC degrees. For the Chemistry B.S., this requirement can be satisfied by receiving a passing grade in the upper-division labs listed below. These courses provide modern, individualized training in the discipline thus serving as relevant capstone experiences.

CHEM 151L	Inorganic Chemistry Laboratory	2
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Plus one of the following courses:

CHEM 146A	Advanced Laboratory in Organic Chemistry	3
CHEM 146B	Advanced Laboratory in Inorganic Chemistry	3
CHEM 146C	Advanced Laboratory in Physical Chemistry	3

** CHEM 146A is offered in the fall quarter; CHEM 146B or CHEM 146C is offered in spring.

Two of the required general education requirements will be fulfilled by the major requirements listed in the above planner (MF and SI). In addition to the specific courses shown in these planners, a student will also need to complete courses satisfying the following general education requirements: Cross-Cultural Analysis, Ethnicity & Race, Interpreting Arts & Media, Statistical Reasoning, Textual Analysis & Interpretation, Perspectives, and Practice

Planners

This is the ideal academic plan for those pursuing a chemistry B.S. major. If needed, this plan can be arranged differently. Please see an academic advisor in the Chemistry Department to create your specific official academic plan

Sample Four-Year Planner

	Fall	Winter	Spring
1st (frosh)	MATH 11A or MATH 19A	MATH 11B or MATH 19B	CHEM 1C & CHEM 1N
	CHEM 1A	CHEM 1B & CHEM 1M	MATH 21
2nd (soph)	CHEM 8A & CHEM 8L	CHEM 8B & CHEM 8M	CHEM 110 & CHEM 110L
	PHYS 6A & PHYS 6L	MATH 22	PHYS 6B & PHYS 6M

Sample Transfer Two-Year Planner

This is the ideal planner for students who have transferred in with both the required and highly recommended courses. **Note:** Failure to complete both the required and highly recommended courses prior to transfer may require additional time to degree. Please refer to the following academic planners that detail student plans with only the minimum transfer requirements completed. Please see an academic advisor in the Chemistry Department to create your specific official academic plan

	Fall	Winter	Spring
1st (junior)	CHEM 163A	CHEM 163B	CHEM 163C
	PHYS 6C & PHYS 6N	CHEM 151A & CHEM 151L	CHEM 110 & CHEM 110L
2nd (senior)	CHEM 146	CHEM 164	CHEM elective
	CHEM elective	MATH 21	CHEM 103

Note: Failure to complete both the required and highly recommended courses before transfer may require additional time to degree. Please refer to the following academic planners that detail student plans with only the minimum transfer requirements completed.

Required courses before transferring:

- General chemistry (full sequence with lab) CHEM 1A, CHEM 1B & CHEM 1M and CHEM 1C & CHEM 1N
- Single variable calculus (full sequence) MATH 11A, MATH 11B
 - Multivariable calculus (one-semester course) MATH 22

Highly Recommended Courses before transferring:

- Organic chemistry (full sequence with lab) CHEM 8A & CHEM 8L, CHEM 8B & CHEM 8M
 - Calculus-based physics PHYS 6A & PHYS 6L, PHYS 6B & PHYS 6M

Biochemistry Concentration

The biochemistry concentration is designed for students who intend to pursue a career in biochemistry or in a related field such as biotechnology, and it provides an exceptionally rigorous chemistry emphasis.

Course Requirements

Lower-Division Courses

General Chemistry:

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1M	General Chemistry Laboratory	2
CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2

Calculus:

Choose one of the following options:

Either these courses		
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5
or these courses		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

A student may combine the MATH 11 series with the MATH 19 series to complete this portion of the major requirement(s). For example, a student can take and complete MATH 19A and then take and complete MATH 11B.

Multivariable Calculus:

Either this course		
MATH 22	Introduction to Calculus of Several Variables	5
or these courses		
MATH 23A	Vector Calculus	5
MATH 23B	Vector Calculus	5
or this course		
AM 30	Multivariate Calculus for Engineers	5

Advanced Mathematics:

Choose one of the following courses:

AM 10	Mathematical Methods for Engineers I	5
MATH 21	Linear Algebra	5
MATH 24	Ordinary Differential Equations	5

Introductory Biology:

BIOL 20A	Cell and Molecular Biology	5
BIOE 20B	Development and Physiology	5

Physics:

Choose one of the following options:

Either these courses		
PHYS 5A	Introduction to Physics I	5
PHYS 5L	Introduction to Physics I Laboratory	1
PHYS 5B	Introduction to Physics II	5
PHYS 5M	Introduction to Physics II Laboratory	1
PHYS 5C	Introduction to Physics III	5
PHYS 5N	Introduction to Physics III Laboratory	1
or these courses		
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 6B	Introductory Physics II	5
PHYS 6M	Introductory Physics II Laboratory	1
PHYS 6C	Introductory Physics III	5
PHYS 6N	Introductory Physics III Laboratory	1

A student may combine the PHYS 5 series with the PHYS 6 series to complete this portion of the major requirement(s). For example, a student can take and

complete PHYS 5A and PHYS 5L and then take and complete PHYS 6B and PHYS 6M and PHYS 6C and PHYS 6N.

Organic Chemistry:

CHEM 8A	Organic Chemistry	5
CHEM 8L	Organic Chemistry Laboratory	2
CHEM 8B	Organic Chemistry	5
CHEM 8M	Organic Chemistry Laboratory	2

By permission and invitation of the instructor, students may substitute CHEM 8M with CHEM 8N, Honors Organic Chemistry Lab. This course is designed to introduce the exceptional student to many of the techniques associated with organic chemistry while taking part in an active organic chemistry research experience.

Upper-Division Courses

Intermediate Organic Chemistry:

CHEM 110	Intermediate Organic Chemistry with Emphasis on Synthesis and Analytical Methods	5
CHEM 110L	Intermediate Organic Chemistry Laboratory	2

By permission and invitation of the instructor, students may substitute CHEM 110L with CHEM 110N, Honors Organic Chemistry Lab. This course is designed to introduce the exceptional student to many of the techniques associated with organic chemistry while taking part in an active organic chemistry research experience.

Inorganic Chemistry:

CHEM 151A	Chemistry of Metals	5
CHEM 151L	Inorganic Chemistry Laboratory	2

Biochemistry:

BIOC 100A	Biochemistry and Molecular Biology	5
BIOC 100B	Biochemistry and Molecular Biology	5
BIOC 100C	Biochemistry and Molecular Biology	5
BIOC 110L	Advanced Biochemistry Laboratory	5

Physical Chemistry:

CHEM 163A	Quantum Mechanics and Basic Spectroscopy	5
CHEM 163B	Chemical Thermodynamics	5
CHEM 163C	Statistical Thermodynamics and Kinetics	5

Electives

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) Requirement. The DC Requirement in chemistry with a biochemistry concentration is satisfied by completing

CHEM 151L	Inorganic Chemistry Laboratory	2
BIOC 110L	Advanced Biochemistry Laboratory	5

Comprehensive Requirement

The comprehensive requirement is a part of all UCSC degrees. For the Chemistry B.S with a Biochemistry Concentration, this requirement can be satisfied by receiving a passing grade in the upper-division labs listed below. These courses provide modern, individualized training in the discipline thus serving as relevant capstone experiences.

CHEM 151L	Inorganic Chemistry Laboratory	2
BIOC 110L	Advanced Biochemistry Laboratory	5

Planners

This is the most general academic plan for this major. If needed, the plan can be rearranged. Please see an academic advisor in the Chemistry Department to create your specific official academic plan

	Fall	Winter	Spring
1st (frosh)	MATH 11A or MATH 19A	MATH 11B or MATH 19B	BIOL 20A
	CHEM 1A	CHEM 1B & CHEM 1M	CHEM 1C & CHEM 1N
2nd (soph)	CHEM 8A & CHEM 8L	CHEM 8B & CHEM 8M	CHEM 110 & CHEM 110L
	BIOE 20B	MATH 22	MATH 21
3rd (junior)	BIOC 100A	BIOC 100B	BIOC 100C
	PHYS 6A & PHYS 6L	PHYS 6B & PHYS 6M	PHYS 6C & PHYS 6N
4th	CHEM	CHEM	CHEM

(senior)*	163A	163B	163C
		CHEM 151A & CHEM 151L	BIOC 110L

Two of the required general education requirements will be fulfilled by the major requirements listed in the above planner (MF & SI). In addition to the specific courses shown in these planners, a student will also need to complete courses satisfying the following general education requirements: Cross-Cultural Analysis, Ethnicity & Race, Interpreting Arts & Media, Statistical Reasoning, Textual Analysis & Interpretation, Perspectives, and Practice

Sample Transfer Two-Year Planner

This is the ideal planner for students who have transferred in with both the required and highly recommended *UC Transfer Pathway courses. **Note:** Failure to complete both the required and highly recommended courses prior to transfer may require additional time to degree. Please refer to the following academic planners that detail student plans with only the minimum transfer requirements completed. Please see an academic advisor in the Chemistry Department to create your specific official academic plan

	Fall	Winter	Spring
1st (junior)	BIOC 100A	BIOC 100B	BIOC 100C CHEM 110 & CHEM 110L
2nd (senior)	CHEM 163A	CHEM 163B CHEM 151A & CHEM 151L	CHEM 163C BIOC 110L

Note: Failure to complete both the required and highly recommended courses prior to transfer may require additional time to degree. Please refer to the following academic planners that detail student plans with only the minimum transfer requirements completed.

Required Courses prior to transfer:

- General chemistry (full sequence with lab) CHEM 1A, CHEM 1B & CHEM 1M and CHEM 1C & CHEM 1N

- Single variable calculus (full sequence) MATH 11A, MATH 11B

- Multivariable calculus (one-semester course) MATH 22

Highly Recommended Courses prior to transfer:

- Organic chemistry (full sequence with lab) CHEM 8A & CHEM 8L, CHEM 8B & CHEM 8M

- Calculus-based physics PHYS 6A & PHYS 6L, PHYS 6B & PHYS 6M

BIOCHEMISTRY AND MOLECULAR BIOLOGY B.S.

Information and Policies

Introduction

Research at the macromolecular, molecular, and atomic levels is revolutionizing our understanding of the fundamental processes of life. Students interested in joining this search are best prepared by undertaking coursework in biology, chemistry, physics, mathematics, and computer science. The undergraduate major in Biochemistry and Molecular Biology (BMB) is offered by faculty who are actively engaged in research on biological systems.

Students who declare the BMB major earn a bachelor of science (B.S.) degree. The BMB major constitutes an integrated curriculum of basic instruction in biology, chemistry, mathematics, and physics, followed by the opportunity to pursue advanced study in specialized areas of interest. In modern, well-equipped laboratories, distinguished faculty are engaged in frontline research at UCSC. The Department of Chemistry and Biochemistry and the Department of Molecular, Cell, and Developmental Biology each host a very active seminar series in which internationally-recognized scientists present their current research findings. Advanced BMB undergraduates are encouraged to attend.

The BMB program features close faculty-student interaction, stimulating learning environments, and opportunities for independent research and study. Students majoring in BMB are encouraged to become involved in research under the guidance of a faculty sponsor. Many students participating in this aspect of the program have made important contributions to the scientific literature.

Given the wide scope and interdisciplinary nature of this program, a considerable degree of flexibility has been incorporated into the major. All prospective majors should see the BMB academic advisor in the Chemistry and Biochemistry Department Office as early as possible. Junior transfer students or others with questions should consult the program website. A double major of BMB

with the biological sciences majors or chemistry is not permitted. No minor is offered.

Academic Advising for the Program

The Chemistry and Biochemistry advisor provides counsel to undergraduate majors. Students are encouraged to seek out advising and assistance in planning their academic careers to ensure completion of their major in a timely manner. For assistance, please contact Chemistry Advising at chemistryadvising@ucsc.edu or visit our department website. Transfer students should also consult the Transfer Information and Policy Section below.

Getting Started in the Major

Prospective majors should have a solid foundation in high school mathematics; familiarity with algebra, logarithms, trigonometry, and analytic geometry is particularly required. Students taking chemistry at UC Santa Cruz begin with CHEM 1A or CHEM 1B, both of which require a strong background in high school chemistry.

Prerequisites

In order to determine what preparation may be needed to succeed in the general chemistry sequence, CHEM 1A, CHEM 1B, and CHEM 1C students are encouraged to take the Chemistry Self-Assessment Examination.

Program Learning Outcomes

Learning outcomes summarize the most important knowledge, skills, abilities, and attitudes that students are expected to develop over the course of their studies. The program learning outcomes clearly communicate the faculty's expectations to students, provide a framework for faculty evaluation of the curriculum based on empirical data, and help improve and measure the impact of implemented changes.

Students graduating with a B.S. in biochemistry and molecular biology should be able to:

- demonstrate mastery of a broad set of chemical and biological knowledge concerning the fundamentals in the basic areas of the discipline (organic, inorganic, analytical, physical, biochemistry, and molecular biology);
- solve area-specific problems by identifying the essential parts of a problem, formulating a strategy for solving the problem, applying appropriate techniques to arrive at a solution, testing the correctness of the solution, and interpreting their results;
- use modern library search tools (such as SciFinder, PubMed, or Web of Science) to locate and retrieve scientific information about topics relating to chemistry and biology;
-

know and follow the proper procedures and regulations for safe handling and use of chemicals, nucleic acids and common laboratory instruments;

- understand the objective of their chemical and biological experiments, properly carry out the experiments, and appropriately record and analyze the results;
- use computers in data acquisition and processing, and use available software as a tool in data analysis;
- use standard laboratory equipment, modern instrumentation, and classical techniques to carry out experiments;
- communicate the concepts and results of their laboratory experiments through effective writing and/or oral communication using the discipline standards for reporting and citation; and
- collaborate effectively as part of a team to solve problems, debate different points of view, and interact productively with a diverse group of team members.

Major Qualification Policy and Declaration Process

Major Qualification

Students must complete the following qualification courses, or their equivalents, each with a grade of C (2.0) or better and with a cumulative grade point average (GPA) of 2.50 or greater in these five required courses:

CHEM 1B	General Chemistry	5
CHEM 1C	General Chemistry	5
CHEM 8A	Organic Chemistry	5
CHEM 8B	Organic Chemistry	5
BIOL 20A	Cell and Molecular Biology	5

Note that since CHEM 1A is a prerequisite for CHEM 1C, students must also complete CHEM 1A with a grade of C or better. Transfer students must have a full year of general chemistry.

Students must have taken CHEM 8B or be enrolled prior to the end of year two.

Plus one of the following options:

Either this course		
MATH 11A	Calculus with Applications	5
or this course		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5

Appeal Process

Students may appeal to the major either prior to **OR** after submitting a petition to declare and being denied (in the latter case, appeals must be submitted within 15 days from the date the denial notification was sent).

To appeal to declare a Chemistry major, submit a letter to the chemistry advisor, chemistryadvising@ucsc.edu.

Within 15 days of receipt of the appeal, the department will notify the student and their affiliated college of the decision. For more information about the appeal process, see the Appeal Process on the Chemistry website.

How to Declare a Major

You may declare a major as early as you would like if you have decided which major to pursue and have satisfied prerequisites or qualification requirements (if any) for the major. Students should submit a petition to declare as soon as they complete the major qualification requirements or reach their declaration deadline quarter (whichever comes first).

Students who enter UC Santa Cruz as frosh are required to formally petition to declare a major by the campus deadline in their sixth quarter and before enrolling in their third year (or equivalent). Upper-division transfer students are required to be declared in a major by the deadline in their second term at UCSC.

Each major/minor advising office has a process for declaring. To initiate the process to declare, please complete the online declaration petition located on the Department of Chemistry website. For assistance, please contact chemistry advising at chemistryadvising@ucsc.edu.

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed major qualification courses.

Transfer Information and Policy

Transfer Admission Screening Policy

The following courses or their equivalents are required prior to transfer, by the end of the spring term for students planning to enter in the fall.

CHEM 1B	General Chemistry	5
CHEM 1C	General Chemistry	5
CHEM 8A	Organic Chemistry	5
CHEM 8B	Organic Chemistry	5
BIOL 20A	Cell and Molecular Biology	5

Plus one of the following options:

Either this course

MATH 11A	Calculus with Applications	5
or this course		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5

Students Entering at the Junior Level

Students entering at the junior level who wish to graduate in two years after coming to UC Santa Cruz should also complete the equivalents of the following preparatory courses prior to transfer:

BIOE 20B	Development and Physiology	5
CHEM 8L	Organic Chemistry Laboratory	2
CHEM 8M	Organic Chemistry Laboratory	2

As well as one of the following:

Either this course		
MATH 11B	Calculus with Applications	5
or this course		
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

While not a required course, MATH 22 is recommended for students who wish to take CHEM 163A/CHEM 163B instead of BIOC 163A/BIOC 163B

Getting Started at UCSC as a Transfer Student

Transfer students are highly encouraged to meet with the chemistry academic advisor in their first quarter. For assistance with advising, please contact Chemistry Advising at chemistryadvising@ucsc.edu. More information specific to transfer students may also be found on our department website.

Students who have satisfied the screening requirements can declare their major any time after coming to UC Santa Cruz but are required to be declared in a major by the applicable deadline; in their second term at UCSC for students entering at the junior level.

Transfer students who are proposed in a different major (other than chemistry) and have advanced standing when they come to UC Santa Cruz require permission from the department to change into the major. Admission to the major is not guaranteed. For more information on qualifying for the major as a transfer applicant, see the Transfer Students webpage.

Letter Grade Policy

For all students entering UCSC in fall 2001 and later, all courses used to satisfy any of the major requirements must be taken for a letter grade.

Additionally, letter grades of C or higher must be attained in all major courses to meet requirements for graduation.

[Optional Catchall]

Course Substitution Policy

At least half of the upper-division courses (numbered 100–199) required for any biochemistry and molecular biology major must be taken through the chemistry or biology programs at UCSC, not as transfer credits from another department or institution. Students are advised to contact the Chemistry and Biochemistry Department undergraduate advisor before enrolling in numerous upper-division courses at other institutions. For more information on transferring courses to UCSC, please consult the Chemistry and Biochemistry Department website.

Double Majors and Major/Minor Combinations Policy

A double major of BMB with the biological sciences majors or chemistry is not permitted. No minor is offered.

Study Abroad

Honors

Honors in the majors are awarded to graduating students whose academic performance demonstrates excellence at a GPA of 3.5 or above. Highest honors are awarded to those students whose performance demonstrates the highest level of excellence and results in a GPA of 3.8 or above.

Program Planning Notes

Students who do not begin the lower-division requirements during their first year, and who do not complete the organic chemistry requirements by the end of their second year, will have difficulty completing the program within four years. The BMB academic advisor works closely with students interested in pursuing the major to ensure that they begin the program immediately and follow the appropriate steps toward completion.

It is strongly recommended that students avail themselves of the opportunities to obtain firsthand research experience through either independent study, senior thesis research, or by working in a faculty research lab.

A number of graduate courses in Biochemistry and Molecular Biology are offered by both the molecular, cell, and developmental biology (MCDB), and chemistry and biochemistry departments. Advanced undergraduates possessing the necessary prerequisites may take one or more of these courses with the consent of the instructor.

Materials Fee

Biochemistry and Molecular Biology students should be aware of the materials fee required for some laboratory courses. The fee is billed to the student's account for specific laboratory materials purchased through the

university. Fees generally range from \$18 to \$75 per course. Students may incur additional expenses purchasing individual supplies.

[Optional Catchall]

Requirements and Planners

Course Requirements

Lower-Division Courses

General Chemistry

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1M	General Chemistry Laboratory	2
CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2

Calculus

Either these courses		
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5
or these courses		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

Statistics

Either this course		
STAT 5	Statistics	5
or these courses		
STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

Intro Biology

BIOL 20A	Cell and Molecular Biology	5
BIOE 20B	Development and Physiology	5
BIOL 20L	Experimental Biology Laboratory	2

Organic Chemistry

CHEM 8A	Organic Chemistry	5
CHEM 8L	Organic Chemistry Laboratory	2
CHEM 8B	Organic Chemistry	5

CHEM 8M	Organic Chemistry Laboratory	2
Physics		
Either these courses		
PHYS 5A	Introduction to Physics I	5
PHYS 5L	Introduction to Physics I Laboratory	1
PHYS 5B	Introduction to Physics II	5
PHYS 5M	Introduction to Physics II Laboratory	1
PHYS 5C	Introduction to Physics III	5
PHYS 5N	Introduction to Physics III Laboratory	1
or these courses		
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 6B	Introductory Physics II	5
PHYS 6M	Introductory Physics II Laboratory	1
PHYS 6C	Introductory Physics III	5
PHYS 6N	Introductory Physics III Laboratory	1

A student may combine the PHYS 5 series with the PHYS 6 series to complete this portion of the major requirement(s). For example, a student can take and complete PHYS 5A and PHYS 5L and then take and complete PHYS 6B and PHYS 6M and PHYS 6C and PHYS 6N.

Upper-Division Courses

Biochemistry and Molecular Biology

BIOC 100A	Biochemistry and Molecular Biology	5
BIOC 100B	Biochemistry and Molecular Biology	5
BIOC 100C	Biochemistry and Molecular Biology AND	5

Either this course		
BIOL 101L	Molecular Biology Laboratory	2

or this course		
BIOL 102L	Toxic RNA Lab II	5

Genetics

BIOL 105	Genetics	5
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Cell Biology

BIOL 110	Cell Biology	5
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Eukaryotic Molecular Biology

BIOL 115	Eukaryotic Molecular Biology	5
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Physical Chemistry

BIOC 163A	Quantum Mechanics, Spectroscopy and Molecular Structure for Biochemistry and Molecular Biology	5
BIOC 163B	Biochemical Thermodynamics and Statistical Mechanics for Biochemistry and Molecular Biology	5

A student may combine the CHEM 163 series with the BIOC 163 series to complete this portion of the major requirement(s). For example, a student can take and complete CHEM 163A and then take and complete BIOC 163B. Be aware of the MATH 22 prerequisite for CHEM 163A and CHEM 163B.

Senior Exit Lab

One of the following laboratory courses (also satisfies the Disciplinary Communication (DC) and Comprehensive Requirement):

BIOC 110L	Advanced Biochemistry Laboratory	5
BIOL 100L	Biochemistry Laboratory	5
BIOL 103L	Toxic RNA Lab III	5
BIOL 105L	Eukaryotic Genetics Laboratory	5
BIOL 106L	Eukaryotic Genetic Engineering	5
BIOL 108L	Synthetic Gene Regulation Lab III	5
BIOL 109L	Yeast Molecular Genetics Laboratory	5
BIOL 110L	Cell Biology Laboratory	5
BIOL 115L	Eukaryotic Molecular Biology Laboratory	5
BIOL 121L	Environmental Phage Biology Laboratory	5
BIOL 186L	Undergraduate Research in MCD Biology	5
METX 119L	Microbiology Laboratory	5

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement in Biochemistry and Molecular Biology is satisfied by completing one of the Senior Exit Labs listed in the previous section.

The DC requirement must be satisfied at UC Santa Cruz and may not be transferred from another institution.

Comprehensive Requirement

Students must satisfy the comprehensive requirement by receiving a passing letter grade in any of the Senior Exit Labs listed in the previous section. In addition, students are encouraged to get research experience by working in a faculty research lab.

Planners

This is the ideal academic plan for those pursuing the biochemistry and molecular biology B.S. major. Please see an academic advisor in the Chemistry Department to create your specific official academic plan.

Sample Four-Year Planner

	Fall	Winter	Spring
1st (frosh)	MATH 11A or MATH 19A CHEM 1A	MATH 11B or MATH 19B CHEM 1B & CHEM 1M	BIOL 20A CHEM 1C & CHEM 1N
2nd (soph)	BIOE 20B CHEM 8A & CHEM 8L	MATH 22 (optional) CHEM 8B & CHEM 8M BIOL 20L	BIOL 105 STAT 5
3rd (junior)	BIOC 100A BIOL 101L	BIOC 100B PHYS 6A & PHYS 6L	BIOC 100C PHYS 6B & PHYS 6M
4th (senior)	BIOC 163A PHYS 6C & PHYS 6N	BIOC 163B BIOL 115	Senior exit lab BIOL 110

Courses are subject to being offered in different terms. Please check departmental websites for updates on course offerings.

Three of the required general education requirements will be fulfilled by the major requirements listed in the above planner (MF, SI & SR). In addition to the specific courses shown in these planners, a student will also need to complete courses satisfying the following general education requirements: Cross-Cultural Analysis, Ethnicity & Race, Interpreting Arts & Media, Textual Analysis & Interpretation, Perspectives, and Practice.

Sample Transfer Two-Year Planner

This is the ideal planner for students who have transferred in with both the required and highly recommended UC Transfer Pathway courses. **Note:** Failure to complete both

the required and highly recommended courses prior to transfer may require additional time to degree. Please refer to the following academic planners that detail student plans with only the minimum transfer requirements completed. Please see an academic advisor in the Chemistry Department to create your specific official academic plan.

Sample Transfer Two-Year Planner

	Fall	Winter	Spring
1st (junior)	BIOC 100A BIOL 101L STAT 5	BIOC 100B PHYS 6A & PHYS 6L	BIOC 100C PHYS 6B & PHYS 6M BIOL 105
2nd (senior)	BIOC 163A PHYS 6C & PHYS 6N	BIOC 163B BIOL 115	Senior exit lab BIOL 110

UC Transfer Pathway courses:

- General biology with lab (full introductory sequence) BIOL 20A, BIOE 20B, BIOL 20L
- General chemistry with lab (one-year sequence) CHEM 1A, CHEM 1B & CHEM 1M, CHEM 1C & CHEM 1N
- Calculus for STEM majors (one-year sequence) MATH 11A & MATH 11B, MATH 22
- Organic chemistry with lab (one-year sequence) CHEM 8A & CHEM 8L, CHEM 8B & CHEM 8M

Courses are subject to being offered in different terms. Please check departmental websites for updates on course offerings.

CHEMISTRY MINOR

For all students entering UC Santa Cruz in fall 2014 and later, all courses used to satisfy degree requirements in the chemistry and biochemistry minor must be taken for a letter grade.

For assistance please contact chemistry advising at chemistryadvising@ucsc.edu or visit our department website.

How to Declare the Chemistry Minor

Students electing a chemistry minor may not use the online petition to declare. Students should obtain a signed

UCSC Academic Planning Form from their first major advisor then bring a copy of that plan to the second major advisor. The second major advisor will review policy and time to degree guidelines on a quarter-by-quarter basis to determine ability to complete the program within the maximum number of quarters of enrollment available to you at UCSC. Advisors from both programs will sign both your Petition for Declaration of Major and your Academic Planning Form.

More information on minors may be found in the Office of the Registrar's Degree Requirements section of the Navigator.

Course Requirements

Lower-Division Courses

Chemistry

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1M	General Chemistry Laboratory	2
CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2
CHEM 8A	Organic Chemistry	5
CHEM 8L	Organic Chemistry Laboratory	2
CHEM 8B	Organic Chemistry	5
CHEM 8M	Organic Chemistry Laboratory	2

Calculus

One of the following options

Either these courses

MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5

or these courses

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

Plus one of the following options

Either this course

MATH 22	Introduction to Calculus of Several Variables	5
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or these courses

MATH 23A	Vector Calculus	5
MATH 23B	Vector Calculus	5
OR		
AM 30	Multivariate Calculus for Engineers	5

Physics

PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 6B	Introductory Physics II	5
PHYS 6M	Introductory Physics II Laboratory	1
PHYS 6C	Introductory Physics III	5
PHYS 6N	Introductory Physics III Laboratory	1
OR		
PHYS 5A	Introduction to Physics I	5
PHYS 5L	Introduction to Physics I Laboratory	1
PHYS 5B	Introduction to Physics II	5
PHYS 5M	Introduction to Physics II Laboratory	1
PHYS 5C	Introduction to Physics III	5
PHYS 5N	Introduction to Physics III Laboratory	1

Upper-Division Courses

This course

CHEM 163A	Quantum Mechanics and Basic Spectroscopy	5
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Students may substitute BIOC 163A for CHEM 163A.

Plus two of the following courses

CHEM 103	Biochemistry	5
CHEM 110	Intermediate Organic Chemistry with Emphasis on Synthesis and Analytical Methods	5
CHEM 151A	Chemistry of Metals	5

Electives

Plus two chemistry upper-division electives from the following:

CHEM 143	Organic Chemical Structure and Reactions	5
CHEM 144	Catalysis In Organic Synthesis Using Metals and Metalloids Based Reagents	5
CHEM 151B	Chemistry of the Main Group Elements	5
CHEM 156C	Materials Chemistry	5
CHEM 163B	Chemical Thermodynamics	5
CHEM 163C	Statistical Thermodynamics and Kinetics	5
CHEM 169	Chemistry and Biology of Drug Design and Discovery	5
CHEM 171	Chemical Biology	5
BIOC 100A	Biochemistry and Molecular Biology	5
BIOC 100B	Biochemistry and Molecular Biology	5

METX 101	Sources and Fates of Pollutants	5
METX 102	Cell and Molecular Toxicology	5
OCEA 120	Aquatic Chemistry: Principles and Applications	5
OCEA 121	Aqueous Geochemistry	5
PHYS 180	Biophysics	5

Students cannot receive elective credit toward the minor for 1) both BIOC 100A and CHEM 103; 2) both BIOC 163B and CHEM 163B. Students may also satisfy the elective requirement by completing a chemistry graduate course with the permission of the instructor and department. Please consult with the department undergraduate adviser prior to enrolling.

CHEMISTRY M.S.

Introduction

Note: Applications for the Research Thesis path master's degree are not being accepted at this time.

The Department of Chemistry and Biochemistry offers a **coursework path** to the master's degree in which a student may earn the M.S. degree after approximately one year of coursework and a capstone seminar. This program serves the needs of such diverse groups as teachers on sabbaticals, technicians from industry and re-entry students. The coursework M.S. does not require research and is suited to future teachers and others wishing to update or broaden their chemical expertise. The degree can be finished in one year if the student is well prepared for attainment exams. No financial aid is available for this program, although student loans may be available based from the FAFSA (Free Application for Federal Student Aid) program.

Prerequisites: A bachelor of arts (B.A.) or bachelor of science (B.S.) degree in chemistry or biochemistry. Applicants with a bachelor's degree in another discipline must have taken all or most of the courses required for a B.A. or B.S. in chemistry or biochemistry at UC Santa Cruz.

Requirements

Course Requirements

Nine courses are required. Of these, at least seven must be lecture courses offered by the Department of Chemistry and Biochemistry. The remaining two courses may be lecture courses, seminars or independent study.

Of the seven Chemistry and Biochemistry lecture courses, at least four must be graduate level (200), but up to three may be advanced undergraduate level (100), excluding CHEM 109-CHEM 110. Courses used to satisfy attainment deficiencies (CHEM 163A-CHEM 163C, CHEM 151A, CHEM 103, and CHEM 143) do not count.

The seven lecture courses must include representatives from at least three of the chemistry subdisciplines: biochemistry, inorganic, organic, and physical.

For a further description of courses available, please visit the Graduate Student Handbook.

Other Requirements

A solid foundation in undergraduate chemistry is essential to a student's progress in graduate studies and research. For this reason, all graduate degree candidates are required to take **entrance (attainment) exams** to confirm their preparation in the fields of biochemistry, inorganic, organic and/or physical chemistry.

Students must satisfy the attainment requirement in three of four subdisciplines of their choosing.

Capstone Requirement

The candidate is required to present a passing literature seminar on a topic of their choosing, demonstrating the ability to read and critically analyze research data, to organize data into a coherent presentation, and to communicate the information in a clear and logical manner.

Applying for Graduation

M.S. students must complete the Application for the Master's Degree form by the appropriate quarter's deadline listed in the current Academic calendar.

The form can be found on the Graduate Division website or can be provided by the Chemistry Department. The form should be turned in to the graduate adviser and program coordinator for review and submission to the Graduate Division.

CHEMISTRY PH.D.

Introduction

Within the Ph.D. program students have the flexibility to design a course of study focused on personal research interests, and at the same time are expected to maintain the high intellectual standards associated with the doctoral degree. Research options include biochemistry, physical chemistry, biophysical chemistry, inorganic chemistry, bioinorganic chemistry, materials chemistry, physical-organic chemistry, and bioorganic chemistry. Some research groups are interdisciplinary and are involved in two or more of these areas.

The Program in Biomedical Sciences and Engineering fosters interdisciplinary research between the Chemistry and Biochemistry Department and the Departments of Molecular, Cell and Developmental Biology; Microbiology and Environmental Toxicology; and Biomolecular Science and Engineering. First-year students can do research rotations with more than 60 faculty members, who come primarily from the Departments of Molecular, Cell, and Developmental Biology, Biomolecular Engineering, Chemistry and

Biochemistry, and Microbiology and Environmental Toxicology.

Advancement to Candidacy

Course Requirements

Graduate students are expected to acquire an in-depth understanding of their area of specialization through a core curriculum that prepares them for advanced study and research. **The course requirement is 15 credits of core courses (three courses) and 10 credits (two courses) of electives.** Electives may be either at the graduate level (200 series) or at the advanced undergraduate level (100 series). Twenty of the 25 credits (four 5-credit courses) must be chemistry and biochemistry courses. The remaining 5 credits may be in chemistry and biochemistry or in a related discipline such as molecular, cell, and developmental (MCD) biology; microbiology and environmental toxicology; physics; math; biomolecular engineering; electrical engineering; etc. Eligible electives do not include CHEM 163A/CHEM 163B/CHEM 163C, CHEM 109, CHEM 110, CHEM 110L, CHEM 143 or CHEM 151A, but can include CHEM 151B and CHEM 169. Undergraduate courses taken to satisfy attainment exam deficiencies cannot be counted. The lecture course requirement must be met before advancing to candidacy. Students may take more than the required five courses at any time depending on their interests or research.

Please refer to the Graduate Student Handbook for the current core and elective curriculum by area of specialization.

Pre-Qualifying Requirements

- Graduate students must choose their research advisor and join a lab in spring quarter (by May 1) of the first year. Ph.D. students choose two additional faculty members to complete their research committee.
- The Department of Chemistry and Biochemistry requires that all Ph.D. students give a literature seminar in their fourth, fifth or sixth quarter. Physical, inorganic and biochemistry students present a second-year seminar on a topic of current interest in published research outside the candidate's own research area. Organic students present a second-year seminar on a topic of current interest within the candidate's own research area with the understanding that their actual Ph.D. research may be different and will be subject to the approval of their principal investigator. In each case, the oral presentation is accompanied by a detailed written document that describes the contents of the presentation.

Teaching Requirement

The focus on high quality undergraduate education is one of the most outstanding features of the UC Santa Cruz campus. Teaching is a job that is taken very seriously and many graduate students and faculty come to UCSC because they want to be in an atmosphere where both teaching and research are important. Therefore, we require that each chemistry graduate student serve as a teaching assistant for a **minimum of three quarters**.

Qualifying Examination

By the end of the seventh quarter (typically fall of the third year), pass the Ph.D. oral qualifying examination before an examining committee consisting of three research committee members plus one outside member approved by the graduate dean. The Ph.D. candidate presents (a) a summary of current research results and future directions, and (b) an original research proposal on a chemistry or biochemistry topic unrelated or partially related to the candidate's current thesis research. The latter must be approved by committee prior to the oral examination. In addition, a detailed written research proposal will be submitted for evaluation by the examining committee.

Dissertation

Dissertation

When the dissertation reading committee agrees that the research is ready to be submitted, the student writes the dissertation according to the guidelines prescribed by the University Library and the Graduate Division.

The dissertation, completed in the format specified by the Graduate Council and approved by the dissertation committee, must be submitted to the Graduate Division no later than the last day of the term in which the degree is to be awarded.

Academic Progress

The academic progress of each continuing graduate student shall be reviewed annually by the student's department or committee of studies by the end of the spring term. Students will receive a notice with the committee findings and details of expected requirements for the following year.

Advanced students must meet with their dissertation reading committee at least once a year, typically during the fall quarter, to report progress in an updated prospectus and get advice and guidance for the coming year.

The fourth-year review gives the student an opportunity to focus and plan their research and to begin shaping the final product—the research dissertation. With this goal in mind, the student presents their research progress to the committee, obtains feedback and receives guidance on future directions.

Progress discussions and reviews are held in fall quarter of the fifth year and the sixth year, if necessary, until the dissertation is submitted. The format is the same as described above for the fourth-year review.

Dissertation Defense

The dissertation seminar, a presentation open to the public, should be scheduled at least one week prior to submitting the dissertation. Students must submit the doctoral thesis to the dissertation reading committee for tentative approval at least one month before presenting a defense seminar. The faculty, through the dissertation reading committee chair, makes the final departmental decision regarding the awarding of the Ph.D. degree. The decision is subject to the approval of the graduate dean.

Applying for Graduation

Students close to completing their degree must file an application for the Ph.D. degree early in the quarter in which they wish to graduate (see the Academic and Administrative Calendar for deadline). The application is your official notification to the graduate dean of your intent to graduate. This form is available on the Graduate Division's web site.

Normative Time to Degree

The department has established five years and one quarter normative time to degree. Extensions may be granted in the 17th and 18th quarters if funding is available. Ph.D. candidates are expected to complete research and write the dissertation within nine quarters after advancing to candidacy following a successful Ph.D. oral qualifying examination. Financial support is not available after 18 quarters in the graduate program.

Ph.D. Program in Biomedical Sciences and Engineering (PBSE) Chemical Biology Biochemistry and Biophysics (CB3)

The Department of Chemistry and Biochemistry participates in the graduate Program in Biomedical Science and Engineering (PBSE) through its administration of the Chemical Biology, Biochemistry and Biophysics (CB3) training track. Sixty-one faculty members, who come primarily from the Departments of Molecular, Cell, and Developmental Biology; Biomolecular Engineering; Chemistry and Biochemistry; and Microbiology and Environmental Toxicology offer an unusual breadth of expertise and exceptional opportunities in interdisciplinary graduate research training. When students apply to the PBSE they indicate interest in one of four training tracks:

- Biomolecular engineering and bioinformatics (BMEB)
- Chemical biology, biochemistry and biophysics (CB3)
- Microbial biology and pathogenesis (MICRO)

- Molecular, cell and developmental biology (MCD)

The Ph.D. track in chemical biology, biochemistry and biophysics (CB3) provides students with the opportunity to carry out cutting-edge research at the interface between biology and chemistry. The training program emphasizes analysis of molecular structure and mechanism as well as the use of organic chemistry to address biological questions. Interdisciplinary research is encouraged and supported by a diverse group of faculty.

After successful completion of all of the Ph.D. requirements, students in this track will be awarded a Ph.D. degree in chemistry from the Department of Chemistry and Biochemistry.

The program provides the flexibility to craft an individual curriculum that specifically suits the needs of the student's research interests. Second-year students take oral qualifying examinations and initiate independent research projects that ultimately lead to their dissertation. Advanced graduate students work under the direct supervision of faculty members in a highly interactive, collaborative research environment. All students participate in a variety of seminars, advanced special-topics courses, and research group meetings designed to provide continuing learning opportunities.

Laboratory Rotations

First-year students do three, seven-week rotations during fall and winter quarters in the laboratory of three PBSE-affiliated faculty members. Performance in each rotation is graded as satisfactory/unsatisfactory. At the end of each rotation period, students will present on their project either with a short talk or poster presentation.

Teaching Assistant

Serve as a TA for a minimum of two quarters. Students must meet this requirement before advancing to candidacy.

Oral Qualifying Examination

Pass the Ph.D. oral qualifying examination before an examining committee by the end of the student's sixth quarter. Students must demonstrate an expertise in their area of research and a six-page NIH-style research strategy and specific aims page on their planned dissertation research. Upon passing that examination, the Dissertation Reading Committee (DRC) is formed. The committee comprises the advisor plus two members of the CB3 track.

Third-Year Talk

Students present a public seminar that is based on their dissertation research in the spring quarter of their third year.

Advance to Candidacy

After successfully completing the third year talk and all other requirements have been completed, the student will advance to candidacy.

All students must meet with their dissertation advisory committee each year until completion of the thesis.

Dissertation

The final requirement for the Ph.D. degree is acceptance of the student's dissertation under the rules of the Academic Senate. A three-member dissertation advisory committee (DRC), headed by the student's research advisor, evaluates the dissertation for the department.

Students are required to give a public talk before their final submission on the principal results of their research.

Required Coursework

In addition to the courses listed below, CB3 Ph.D. students are required to take at least three additional graduate-level lecture courses by the end of the third year. A list of approved elective courses is available on the PBSE-CB3 website.

Students also enroll in CHEM 291 (weekly research seminars) until they advance to candidacy.

CHEM 200A	Advanced Biochemistry: Biophysical Methods	5
CHEM 200B	Advanced Biochemistry: Macromolecular Structure and Function	5
CHEM 271	Chemical Biology	5
CHEM 296	Teaching Chemistry	2
BIOL 289	Practice of Science	5

Coastal Science and Policy

Coastal Science and Policy Program
251 Ocean Health Building
<https://csp.ucsc.edu/>

PROGRAMS OFFERED

Coastal Science and Policy M.S. (p. 261)

Coastal Science and Policy Designated Emphasis (p. 263)

OTHER PROGRAMS OF INTEREST

Earth Sciences (p. 264)

Biology: Ecology and Evolutionary Biology (p. 296)

Economics (p. 567)

Environmental Studies (p. 619)

Ocean Sciences (p. 380)

Sociology (p. 710)

COASTAL SCIENCE AND POLICY M.S.

Introduction

Students in the University of California, Santa Cruz's Coastal Science and Policy Program (CSP) will develop a range of skills, interdisciplinary knowledge, and pragmatic approaches to become more effective leaders at solving coastal sustainability challenges, from watersheds to the open ocean. We offer in-depth interaction with faculty members, professionals and practitioners for small cohorts of diverse students hailing from California, additional U.S. states and other nations. In year one of the two-year master's degree program, students take courses on concepts and approaches from the natural and social sciences, including biophysical, ecological, social, economic, policy, leadership, and communication dimensions. The first year also entails a guided, strategic process for each student to develop their second-year capstone project and to identify capstone partner organizations from the non-governmental, government or private sectors. Students additionally participate in workshops to strengthen communication, technical, and leadership skills and in seminars with diverse leaders to build their professional networks. In the second year, each student embeds with their selected partner organization to conduct the solutions-focused capstone project and participates weekly in a video-link capstone seminar. Students also use a summer placement (between years one and two) to gain training in specific skills or to start the capstone project. At the end of the second year, students present their capstone deliverables in writing and via an oral public presentation. With the combination of focused courses, skill set development, and practical experience, graduates will be well prepared and highly competitive for the diverse job opportunities in the growing fields of coastal science and policy. Although the focus of most material will be coastal or marine, the principles and practices learned by the students will be applicable in any geographical location or sector.

The program focuses on practical training to provide integrated, scalable solutions to social and ecological challenges under four broad themes that leverage UCSC's existing leadership in coastal sustainability:

- Conserving biodiversity, sustaining ecosystem processes, and ensuring human well-being
- Mitigating hazards to nature and society; fostering societal adaptation and climate action
- Sustaining marine, freshwater, and terrestrial food and energy systems
- Advancing innovative financial and policy approaches in business, government and civil society

Preparation for Graduate Work in Coastal Science and Policy

Students admitted to the Master of Science (M.S.) in Coastal Science and Policy Program will have completed a bachelor's degree at a four-year university in a field relevant to coastal sustainability. Relevant fields are diverse and include the natural sciences (e.g., biology, earth sciences, chemistry, oceanography), social sciences (e.g., economics or business, human ecology, political science, sociology), interdisciplinary programs (e.g., environmental studies and sciences) and engineering. Regardless of undergraduate major and/or minors, specific additional requirements prior to admission include at least one course in writing and one course in statistics; as well as coursework in at least two of the following three areas: biological sciences, physical sciences, and the social sciences (including policy and economics). Students are not expected to have identified a faculty advisor prior to joining the program. Students from underrepresented and diverse racial, ethnic, cultural, socioeconomic, and disciplinary backgrounds are encouraged to apply. We anticipate that competitive applicants to the program will have additional experience, such as a combination of coursework, internships, jobs and research, in relevant fields.

Requirements

Course Requirements

The master's degree in coastal science and policy is a Plan II (capstone project) degree.

Core Courses

The M.S. program will include a core set of three foundational and seven developmental courses.

Foundational Courses

CSP 200	Natural Sciences for Coastal Sustainability	5
CSP 210	Social Sciences for Coastal Sustainability	5
CSP 220	Economics for Coastal Sustainability	5

Developmental Courses

These courses cut across multiple disciplines and will be taught by core faculty, partner practitioner-scientists, and specialist trainers.

CSP 230	Integrated Problem-Based Discussion	
CSP 231A	CSP Year 1 Capstone Planning & Design Fall	2
CSP 231B	CSP Year 1 Capstone Planning & Design Winter	2
ENVS 240	Public Policy and Conservation	5
ENVS 250	Coastal Governance	5
CSP 244	Adaptation and Planning	5
BIOE 262	Facilitating Change in Coastal Science Policy	5

Methods and Elective Courses

M.S. students are also required to take one methods course and one additional elective course in their first year. The methods and elective courses can be drawn from courses currently offered across the UCSC campus. The methods course should provide training in quantitative or qualitative research design, tools, and analysis, as well as broaden the student's disciplinary knowledge. For example, incoming students with an undergraduate degree in the natural sciences (e.g., ecology) may be expected to take a graduate-level elective course in the social sciences (e.g., politics, economics).

The methods requirement can be met by taking CSP 241/CSP 241L (cross-listed with BIOE 286/BIOE 286L), another course from the list of approved methods courses found here, or by approval of the program director. The selection of the methods and elective courses will be made in consultation with the student's faculty advisor and program, with final approval from the program director.

CSP 281A	Hacking for Oceans—Lean Design Methods	5
CSP 292	Special Topics in Coastal Science and Policy	2
CSP 297	Independent Study in Coastal Science and Policy	5
BIOE 286	Experimental Design and Data Analysis	5
BIOE 286L	Experimental Design and Data Analysis Lab	2

Other Requirements

Summer Placement

During the summer at the end of their first year, M.S. students will be required to participate in an intensive summer placement program. Students may use the summer placement to gain training in specific skills or to start the capstone project. This placement will consist of working within a partner agency, nongovernmental organization, or business to provide trainees with practical awareness in the conservation and sustainability science field and give them firsthand immersion in the processes involved in implementing scientific knowledge and innovations as components of solutions to the complex challenge of domestic or international coastal sustainability. Placement projects will be required to include: 1) a real concern of the institutional partner, 2) research, solutions development, and implementation, and 3) strong interdisciplinary elements. A faculty advisor will oversee the placement. It is the intention that, in collaboration with institutional partners and CSP advisors, students' capstone projects will emerge from, or be heavily informed by this summer placement experience.

Capstone Project

In the second year, students will implement a capstone project by enrolling in and fulfilling the requirements for

CSP 290, Coastal Science and Policy Capstone Project (10 credits/quarter). This project is typically developed during Year 1 of the program in collaboration with a practitioner partner and a CSP faculty advisor, and with oversight from the program. The project should: a) address a real concern of the institutional partner; and b) include research, solutions development, and implementation, and be strongly interdisciplinary in nature. A program team consisting of the student's CSP faculty advisor and practitioner partner will advise on the capstone project, with programmatic guidance from the CSP assistant director. In the final quarter (spring, Year 2) students will provide a final written report and oral presentation of the capstone project to CSP students, faculty and institutional partners. The final presentations will be required to address both the social science and natural science elements of the selected project.

CSP 290A	Coastal Science and Policy Capstone Project	10
CSP 290B	Coastal Science and Policy Capstone Project	10
CSP 290C	Coastal Science and Policy Capstone Project	10

Capstone Project Seminar

Each quarter of the second year, students will enroll in CSP 291, Coastal Science and Policy Capstone Seminar (2 credits/quarter). This seminar will serve as a forum, led by an interdisciplinary team of social/natural science faculty, for students to discuss current topics and approaches in sustainability science as well as an opportunity for students to present issues, topics, and proposals relevant to their capstone projects. Students enrolled in this course will provide oral and written peer review of other students' projects and presentations.

CSP 291	Coastal Science and Policy Capstone Seminar	2
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Planners

	Fall	Winter	Spring
1st Year	CSP 200	ENVS 240	CSP 244
	CSP 210	ENVS 250	BIOE 262
	CSP 220	CSP 231B	Methods or Elective Course
	CSP 230	Methods or Elective Course	
2nd Year	CSP 231A		
	CSP 290A (10 credits)	CSP 290B (10 credits)	CSP 290C (10 credits)
	CSP 291 (2 credits)	CSP 291 (2 credits)	CSP 291 (2 credits)

[Optional Catchall]

Applying for Graduation

COASTAL SCIENCE AND POLICY DESIGNATED EMPHASIS

Introduction

The goal of the Coastal Science and Policy (CSP) program is to train future leaders in the science and policy of coastal sustainability in order to propel sustainable use of coastal resources and conservation of coastal biodiversity, ecosystems, socio-economic integrity, and ecological services. A CSP designated emphasis (DE) will serve Ph.D. students who desire to strengthen their ability to directly connect their science to actionable solutions in collaboration with practitioner organizations.

Students obtaining a DE in Coastal Science and Policy, will develop a range of skills, interdisciplinary knowledge, and trans-disciplinary approaches pertinent to creating real-world solutions to current and emerging concerns for coastal sustainability.

Preparation for Designated Emphasis in Coastal Science and Policy

To receive a designated emphasis in Coastal Science and Policy, graduate students must complete the following requirements in addition to the degree requirements for the doctorate in their home department:

Requirements

Ph.D. students will ideally apply for the CSP DE during their first year and complete a minimum of three CSP courses (15 credits) prior to proceeding to Ph.D. candidacy. The DE will only be available to Ph.D. students; master's students are not eligible.

Committee Composition and Departmental Approvals

The student must have a DE advisor from the CSP core or affiliated faculty. The DE advisor commits to serving on the Ph.D. qualifying exam committee (typically as the outside member), and the dissertation reading committee.

The Ph.D. student's primary faculty advisor, graduate program coordinator/advisor in the student's home department, and CSP program must approve participation in the CSP DE. Only applications from registered students in good standing will be approved for the CSP DE.

The student must meet with their DE advisor to develop a coherent plan for meeting the requirements for the CSP DE, preferably before the end of the student's first year. This plan must be approved by the CSP program director.

Course Requirements

Students are required to complete at least three CSP courses including two required courses (CSP 244 and CSP 245 [BIOE 262]; both offered in spring quarter).

Courses taken to fulfill program requirements within the home department will not count toward the designated emphasis program's required coursework.

CSP 244	Adaptation and Planning	5
BIOE 262	Facilitating Change in Coastal Science Policy	5

Additional Courses

Students work with their CSP advisor to review their academic background and select at least one and up to six additional CSP courses (minimum of five additional credits) to assure overall interdisciplinary competence in: social sciences for sustainability, economics for sustainability, natural sciences for sustainability, statistics, coastal governance, and policy analysis. Select courses from the list below:

CSP 200	Natural Sciences for Coastal Sustainability	5
CSP 210	Social Sciences for Coastal Sustainability	5
CSP 220	Economics for Coastal Sustainability	5
BIOE 286	Experimental Design and Data Analysis	5
BIOE 286L	Experimental Design and Data Analysis Lab	2
ENVS 240	Public Policy and Conservation	5
ENVS 250	Coastal Governance	5
CSP 281A	Hacking for Oceans—Lean Design Methods	5
CSP 292	Special Topics in Coastal Science and Policy	2
CSP 297	Independent Study in Coastal Science and Policy	5

Writing, Research and/or Teaching Requirements

Ph.D. students must work closely with a practitioner partner (from a government, business, or non-profit entity) on one interdisciplinary dissertation chapter on a coastal sustainability issue.

In-depth interaction with the practitioner is necessary in the conceptual formation and execution of the work to be reported in the chapter (i.e., the student cannot solely receive and analyze data from the collaborating practitioner).

The CSP program, via core courses, workshops, and mentoring by CSP faculty, provides substantial guidance on how to collaborate with partners in a manner that fits well with the dissertation research process. This requirement ensures that the student's work will bring their knowledge to action, addresses real-world challenges and implements new, cutting-edge solutions.

[Optional Catchall]**Earth and Planetary Sciences**

A232 Earth and Marine Sciences Building
(831) 459-4089
<https://eps.ucsc.edu>

PROGRAMS OFFERED

- Earth Sciences B.S. (p. 265)
- Environmental Sciences B.S. (p. 282)
- Earth Sciences/Anthropology Combined Major (p. 286)
- Earth Sciences Minor (p. 291)
- Earth Science B.S./M.S. Contiguous Pathway (p. 291)
- Environmental Science B.S./Earth Science M.S. Contiguous Pathway (p. 291)
- Earth Sciences M.S. (p. 294)
- Earth Sciences Ph.D. (p. 295)

OTHER PROGRAMS OF INTEREST

- Environmental Studies B.A. (p. 621)
- Environmental Studies/Earth Science B.A. (p. 642)
- Chemistry B.S. (p. 243)
- Ecology and Evolutionary Biology B.S. (p. 302)
- Science Education B.S. (p. 398)

The Earth and Planetary Sciences Department teaches and conducts research in a wide array of topics. We seek to answer questions such as:

How did the Earth form? How has it evolved since then? What makes up the interior of the Earth? How were Earth's ocean and atmosphere generated, and how have they changed through time?

What is the history of life on Earth? What are the causes and effects of past mass extinctions?

How do mountain ranges form? What causes earthquakes? What causes island chains to form? What controls the evolution of glaciers? How do we prevent coastal erosion? How well can we predict tsunamis?

What has Earth's climate been like in the past? How will climate change in the future? What changes are likely in Earth's atmospheric properties?

What controls the supply and quality of our freshwater resources?

How are other planets in our solar system different from Earth? How did they evolve to their present state? How

have the impacts of asteroids on Earth and other planets affected their evolution?

A variety of methods and tools are used to help us address these questions. Geologists examine rocks and geologic formations in order to understand the processes that control their formation and evolution. Geochemists and mineralogists examine the chemical and mineral composition of rocks, sediments, and fossils using a variety of sophisticated analytical instruments.

Geophysicists use seismometers to not only record earthquakes, but also to learn about the deeper parts of the Earth, which are studied in tandem using high-pressure experiments. Environmental scientists collect samples of the atmosphere, rivers, lakes, and the oceans, sometimes requiring the use of aircraft and ships. Spacecraft have visited and explored all of the planets in our solar system. Space-based satellites have provided a massive amount of data about Earth over the past few decades. Scientists from all disciplines use computer models to help them understand these complex systems.

The Department of Earth and Planetary Sciences offers a number of degrees that teach undergraduate and graduate students the knowledge and skills necessary to address these and many other questions. Along with the standard Earth sciences major, we offer degrees with concentrations in environmental geology, geology, ocean sciences, and planetary sciences. We also offer combined majors with environmental studies and anthropology. A minor in Earth sciences is also available. We offer courses across a wide range of topics, allowing students to tailor the curriculum to their interests. Courses are comprised of not only classroom lectures, but frequently field trips, laboratories, and computer exercises are involved. Many related courses are offered by other departments such as Ocean Sciences, Microbiology and Environmental Toxicology, Environmental Studies, Biological Sciences, Chemistry and Biochemistry, and Astronomy and Astrophysics. The university capstone requirement is often fulfilled by attending the departmental field camp, or by completing a senior research thesis, but other choices are also possible.

Graduates of our department continue on to a variety of careers, such as:

- Business and industry
- Geological and environmental consulting
- Governmental agencies at the federal, state, and local level
- Non-profit organizations
- Research at universities, governmental research institutions, or other scientific agencies
- Graduate/professional school in areas such as science, engineering, teaching, law, public health, business

For more information about the people in the department, their areas of interest, departmental facilities, contact e-

mails and phone numbers, and how to apply to join our department as an undergraduate or graduate student, please see our website.

UNDERGRADUATE PROGRAM

Classes suitable for non majors: EART 1, EART 2, EART 5, EART 8, EART 10, EART 11, EART 12, EART 20, EART 30, EART 66.

GRADUATE PROGRAM

The graduate program in the Earth and Planetary Sciences Department is designed to prepare students for research, industry, consulting, teaching, and numerous other career paths, including business and law. The aim is to develop habits of critical analysis and thorough documentation; skills in quantitative field, computational, and/or laboratory research; and proficiency in one or more fields of research. The fundamental requirements for admission to the program are substantial evidence of superior scholarship, dedication and determination to do quality work, and aptitude for original research. Preparation in the basic sciences equivalent to the requirements for the Earth sciences bachelor's degree at UCSC is expected and, for non-undergraduate Earth sciences majors, achieving breadth of knowledge across the Earth and planetary sciences is expected. Excellent scholars from other disciplines, including chemistry, physics, engineering, biology, or astronomy are both eligible and encouraged to apply. Gaps in knowledge can be made up through coursework.

UCSC awards both the Master of Science (M.S.) and the Doctor of Philosophy (Ph.D.) degrees. The M.S. degree may be the terminal degree for some seeking careers in industry, government, and teaching at the secondary level. It may also be an initial step toward the Ph.D. degree, in which the student gains knowledge and confidence in carrying out and completing a more complex scientific project.

EARTH SCIENCES B.S.

Information and Policies

Introduction

The bachelor of science (B.S.) program is designed for students who intend to pursue professional careers in Earth and planetary sciences, engineering, policy, law, teaching, or business or who otherwise desire the broad, quantitative training available at UC Santa Cruz. In addition to providing comprehensive preparation in the basic physical sciences, and particular breadth and depth in Earth and planetary sciences, the curriculum is structured to prepare students for the competitive graduate school and career marketplace.

The core of the major includes calculus, physics, chemistry, and a group of comprehensive Earth and

planetary sciences courses. For the standard B.S., students then select at least six additional courses from a diverse list of upper-division electives, with at least two that involve significant laboratory or field data acquisition and analysis. These electives, often in combination with additional upper-division courses from this and related departments, provide the student with expertise in one or more subdisciplines within Earth sciences.

Elective distributions can be designed to emphasize earthquake and faulting studies, Earth surface processes, Earth system sciences, geologic hazards, geology, crustal and deep-Earth geophysics, marine geophysics, and water resources. Four formal concentrations, all with specific course requirements and leading to an Earth and planetary sciences B.S., are available: geology, geophysics, ocean sciences, and planetary sciences. A senior comprehensive experience (senior thesis, geologic field camp, or intensive capstone course) is required of all majors.

Academic Advising for the Program

A student who wants to become an Earth sciences major should contact the Earth and Planetary Sciences Department undergraduate staff advisor, epsadvising@ucsc.edu, as soon as possible. Students will submit a declaration of major petition, and are required to meet with the undergraduate advisor to plan their program in detail. Relevant courses taken at UC Santa Cruz or other institutions may be substituted for degree requirements by approved petition. Please see the undergraduate advisor for the substitution petition form and more information about this process. Transfer students should consult the Transfer Information and Policy section for more detailed information about academic advising.

Getting Started in the Major

Welcome! Now that you are a registered freshman, the following information is your guide to getting started in your Earth sciences major.

All freshmen are required to complete summer orientation, for more information visit Campus Orientation Programs. Our freshmen orientation includes everything you need to know to get started on your Earth science major. If you have already attended orientation and simply need a refresher on getting enrolled, see our Freshmen Enrollment Guide.

Students with advanced placement credit must provide Admissions an official copy of your test score. You can verify your Advanced Placement (AP) examinations credit in your MyUCSC portal. For information on how your AP credit applies to your enrollment and your major, see our advanced placement credit page. If you have taken a college-level course that you would like credit for, you must send an official transcript to Admissions. If you wish to have that same course applied toward your major requirements, send an unofficial copy of your transcripts to epsadvising@ucsc.edu.

If you have already been admitted to UC Santa Cruz as a transfer student, our transfer orientation provides instructions on how to transfer your coursework to UC Santa Cruz, the advising and support available, and how to enroll. Our online transfer orientation provides all the critical information you need to transition to UC Santa Cruz and begin your major coursework.

Program Learning Outcomes

Students graduating with a B.S. in Earth and planetary sciences (all concentrations) should be able to:

1. understand the processes governing the properties and evolution of Earth's interior and surface;
2. identify rocks and minerals, and describe their connection to geologic processes;
3. utilize algebraic mathematical tools to quantitatively address questions in the geosciences; and
4. write in a clear, organized, and logical fashion using disciplinary standards for reporting and citation.

Major Qualification Policy and Declaration Process

Major Qualification

To qualify for the Earth sciences B.S. (including all concentrations within the major), a student must complete (with a minimum grade of C) one of the following introductory courses in physical geology:

EART 5	California Geology	5
EART 10	Geologic Principles	5
EART 20	Environmental Geology	5

Transfer students may take an approved substitution for one of the above courses and should consult assist.org for equivalencies and the Transfer and Information Policy section for information about major qualifications.

Appeal Process

If a student completes major qualification courses but does not meet the major qualification criteria, and appeals, the department may accept or reject the appeal or place conditions on the student that will be resolved within at most one more enrolled quarter.

Students who are informed that they are not eligible to declare the major may appeal by submitting a letter to the Earth and Planetary Sciences advisor within 15 days from the date the notification was sent. Within 15 days of receipt of the appeal, the department will notify the student and their affiliated college of the decision.

How to Declare a Major

Students who wish to declare the Earth science major start the process by scheduling an appointment with the department staff advisor to create an academic plan. Once academic planning has been completed students submit

the online major declaration petition to begin the major declaration process. Students are expected to complete the academic planning and online petition by the campus declaration deadline.

Transfer Information and Policy

Transfer Admission Screening Policy

The Earth and Planetary Sciences Department welcomes applications from transfer students who are prepared to enter as Earth Sciences majors. Students should reference assist.org to determine course equivalencies.

No major preparation courses are required prior to transfer; however, the following courses or their equivalents are recommended to ensure timely graduation:

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1M	General Chemistry Laboratory	2
CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2

Plus one of the following options:

Either these courses

MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5

or these courses

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

Plus all of the following courses:

PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 6B	Introductory Physics II	5
PHYS 6M	Introductory Physics II Laboratory	1

Plus one of the following options:

Either these courses

EART 5	California Geology	5
EART 5L	California Geology Laboratory	1

or these courses

EART 10	Geologic Principles	5
EART 10L	Geologic Principles Laboratory	1

or these courses

EART 20	Environmental Geology	5
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EART 20L	Environmental Geology Laboratory	1
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Getting Started at UCSC as a Transfer Student

Whether you are planning for your future transfer or are already admitted to UC Santa Cruz, we aim to provide our transfer students the information and support needed to successfully complete a science degree at UCSC.

Once you have submitted your intent to register at UC Santa Cruz, here is a step-by-step guide to transferring your coursework and enrolling:

1. **Confirm you are a proposed Earth sciences major.** If you are not sure of your status, log on to your MyUCSC portal to view your proposed major. If your major is proposed Earth sciences you are all set. If the proposed major listed is not Earth Sciences, you will need to meet with the advisor for Earth Sciences.
2. **Once your courses have been articulated, you will receive an email from our office.** This email will include information on how your coursework articulated, suggestions for Fall enrollment, and invite you to make an appointment to talk with your major advisor.
3. **Make an appointment to talk to an advisor.** Your confirmation email will include instructions for scheduling an advising appointment. Appointments are available either by phone or in person.
4. **Participate in Transfer Orientation and Welcome Week.** Transfer Orientation provides instructions on how to transfer your coursework to UCSC, the advising and support available, and how to enroll. Our online transfer orientation provides all the critical information you need to transition to UCSC and begin your major coursework.
The department also hosts a transfer student welcome in the fall that provides new transfer students an opportunity to meet other transfer students, familiarize themselves with the campus and the available resources. Welcome Week includes presentations on the Earth sciences majors, including an overview of the field courses offered and an introduction on how to get involved in undergraduate research.
5. **Declaring the Earth Sciences major.** In order to declare the Earth sciences major transfer students must complete EART 5, or EART 10 or EART 20 or an approved equivalent course (with a C or better) and meet with the Earth and Planetary Sciences Department advisor by the declaration deadline.

Letter Grade Policy

All courses used to satisfy requirements for any of the Earth and planetary science majors must be taken for a

letter grade with the exception of the following courses, which may be taken Pass/No Pass: EART 195 Senior Thesis, EART 198 Internship, EART 199 Tutorial. Combined majors (Earth sciences/anthropology and Earth sciences/environmental studies) are currently exempt from this policy.

[Optional Catchall]

Course Substitution Policy

Relevant courses taken at UC Santa Cruz or other institutions may be substituted for degree requirements by approved petition. Please see the undergraduate advisor for the substitution petition form and more information about this process.

Double Majors and Major/Minor Combinations Policy

Study Abroad

Honors

Honors in the major (all concentrations) and in the combined major with anthropology are determined by a review of grades (typically 3.50 or above) at the time a student applies for graduation. A faculty committee makes the decision based on the quality of all coursework, but especially in the courses required for the major. Extra coursework or independent study as well as more intensive or rigorous coursework and the quality of a capstone project may also be taken into consideration. Honors in the combined major with environmental studies are evaluated by the Environmental Studies Department. Highest honors may also be awarded in exceptional cases when a student's overall grade point average (GPA) is above 3.75 and performance in the senior capstone requirement is equally outstanding. The department reserves the right to withhold honors and highest honors based on other criteria, such as an incident of academic dishonesty.

Honors on the senior thesis are determined independently of major honors, and must be approved by two faculty readers.

[Optional Catchall]

Standard Earth Sciences Major

Course Requirements

Lower-Division Courses

All of the following courses:

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1M	General Chemistry Laboratory	2
CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2

Plus one of the following options:

Either these courses		
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5
or these courses		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
or these courses		
AM 15A	Case-Study Calculus I	5
AM 15B	Case-Study Calculus II	5

Plus one of the following courses:

MATH 22	Introduction to Calculus of Several Variables	5
MATH 23A	Vector Calculus	5
EART 111	Mathematics in the Earth Sciences	5
EART 119	Introductory Computer Programming for Geoscientists	5
EART 125	Statistics and Data Analysis in the Geosciences	5

Students that have completed a prior course in programming or statistics may petition for equivalency.

Plus all of the following courses:

PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 6B	Introductory Physics II	5
PHYS 6M	Introductory Physics II Laboratory	1

Plus one of the following options:

Either these courses		
EART 5	California Geology	5
EART 5L	California Geology Laboratory	1
or these courses		
EART 10	Geologic Principles	5
EART 10L	Geologic Principles Laboratory	1
or these courses		
EART 20	Environmental Geology	5
EART 20L	Environmental Geology Laboratory	1

Upper-Division Courses**All of the following courses:**

EART 110A	Evolution of the Earth	5
EART 110L	Evolution of the Earth Laboratory	2
EART 110B	Earth as a Chemical System	5
EART 110M	Earth as a Chemical System Laboratory	2
EART 110C	The Dynamic Earth	5
EART 110N	The Dynamic Earth Laboratory	2

Two field/laboratory/data analysis

Lecture/lab combinations count as one course. The following courses satisfy this requirement:

EART 107	Remote Sensing of the Environment	5
EART 109	Elements of Field Geology	5
EART 109L	Field Geology Laboratory	2
EART 116	Hydrology	5
EART 119	Introductory Computer Programming for Geoscientists	5
EART 120	Sedimentology and Stratigraphy	5
EART 120L	Sedimentology and Stratigraphy Laboratory	2
EART 125	Statistics and Data Analysis in the Geosciences	5
EART 130	Igneous and Metamorphic Petrology	5
EART 130L	Igneous and Metamorphic Petrology Laboratory	2
EART 135L	Practical Geochemistry	5
EART 140	Geomorphology	5
EART 140L	Geomorphology Laboratory	2
EART 142	Engineering Geology for Environmental Scientists	5
EART 146	Groundwater	5
EART 148	Glaciology	5
EART 150	Structural Geology	5
EART 150L	Structural Geology Laboratory	2
EART 189A	Geographic Information Systems with Applications in Earth Sciences	5
EART 189B	Summer Field Study	5
EART 191C	Practical Geophysics	5

Courses used to satisfy the senior comprehensive requirement cannot be used to satisfy this requirement.

Electives

At least four additional upper-division elective courses from Earth sciences or ocean sciences offerings must be completed. Students are encouraged to take more than the minimum number of elective courses and may craft an elective distribution from many areas of specific research and career interests.

EART 196B and EART 198 may not be used to satisfy this requirement.

No more than one quarter of EART 199 may be used to satisfy this requirement.

Lecture/lab combinations count as one course.

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division disciplinary communication (DC) general education requirement. Students in the Earth Sciences B.S. major must complete a minimum of two (2) courses from the list of courses that in combination satisfies the DC general education requirement. Courses taken to satisfy the DC requirement may also satisfy upper-division elective or senior comprehensive requirements. Consult one of the Earth and planetary sciences advisors for the most up-to-date list of scheduled classes.

Currently the list (subject to change) consists of:

EART 100	Vertebrate Paleontology	5
EART 101	Invertebrate Paleobiology	5
EART 102	Marine Geology	5
EART 104	Geologic Hazards	5
EART 109	Elements of Field Geology	5
EART 120	Sedimentology and Stratigraphy	5
EART 140	Geomorphology	5
EART 146	Groundwater	5
EART 148	Glaciology	5
EART 150	Structural Geology	5
EART 160	Planetary Science	5
EART 189B	Summer Field Study	5
EART 191A	Climate Change Science and Policy	5
EART 191C	Practical Geophysics	5
EART 195	Senior Thesis	5

Comprehensive Requirement

All students must satisfy the senior comprehensive requirement. The intent of this requirement is to synthesize knowledge and skills from a student's undergraduate career. Therefore, prior to completing an activity to satisfy the senior comprehensive requirement, students should have already completed EART 110A, one of EART 110B or EART 110C, and three other upper-division courses that fulfill major requirements. Students should consult an advisor if they have any questions about the timing of their proposed comprehensive requirement activity.

Note: Courses used to satisfy the senior comprehensive requirement cannot be used to satisfy the upper-division elective requirement or the field/laboratory/data analysis requirement.

To satisfy the comprehensive requirement, each student in these majors must complete one of the following options:

Satisfactory completion of Summer Field

EART 189A	Geographic Information Systems with Applications in Earth Sciences	5
EART 189B	Summer Field Study	5

Satisfactory completion of a senior thesis

A senior thesis must include a significant element of independent research or original work and can only be undertaken after an agreement is obtained from a faculty member to supervise it. It is recommended that students allocate three quarters for the thesis process.

Students may take EART 199, Independent Study, as part of performing the research for their senior thesis. It is required that each student enroll in and pass EART 195: Senior Thesis, in the academic quarter during which they complete their thesis.

EART 195	Senior Thesis	5
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Satisfactory completion of one of the following capstone course offerings:

EART 191A	Climate Change Science and Policy	5
EART 191B	Planetary Capstone	5
EART 191C	Practical Geophysics	5

Capstone course offerings vary year to year. If you are interested in completing a capstone course please contact the Earth sciences advisor.

Other Options

Other options such as external field research experiences or internships may be suitable by permission of the faculty advisor.

Please meet with an advisor if you have an idea to propose.

Planners

Students planning a professional career in the Earth and planetary sciences should take more than the minimum number of courses required for the major if possible. Four-year students have ample flexibility to take additional electives if they begin with the required courses in their second year. Junior transfers also have flexibility if they have taken most of their preparatory courses in calculus, chemistry, and physics before entry. Further advice can be obtained from the undergraduate advisor and from faculty members.

Sample Four-Year Planner

Year	Fall	Winter	Spring
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1st (frosh)	CHEM 1A	MATH 11A or MATH 19A	EART 10 & EART 10L
		CHEM 1B & CHEM 1M	MATH 11B or MATH 19B
			CHEM 1C & CHEM 1N
2nd (soph)	EART 110A & EART 110L*	EART 110B & EART 110M*	PHYS 6B & PHYS 6M
	MATH 23A or EART 111	PHYS 6A & PHYS 6L	
3rd (junior)	EART elective	EART elective	EART 110C & EART 110N
			EART elective
4th (senior)	EART elective	EART elective	EART 189A* or senior thesis
	(sr thesis only) EART 199†	(sr thesis only) EART 199†	(EART 195)†
	EART elective		

In addition to the specific courses shown in these planners, a student must complete courses satisfying the CC, ER, IM, SR, and TA general education requirements.

*Students who wish to complete their capstone with EART 189A and EART 189B should be aware that the following courses are prerequisites: EART 109 and EART 109L, EART 110A and EART 110L, and EART 110B and EART 110M. Students must also complete EART 189B in summer to fulfill the summer field capstone.

†Students expecting to write a senior thesis for their comprehensive requirement are required to contact the department at least three quarters before graduation to identify the intended project and faculty advisor. Senior

theses usually require at least two or three quarters for completion.

Sample Transfer (Two-Year) Planner

This planner assumes that students have completed all lower-division requirements, other than PHYS 6A and PHYS 6L, PHYS 6B and PHYS 6M, and advanced math.

Year	Fall	Winter	Spring
1st (junior)	EART 111	PHYS 6A & PHYS 6L	PHYS 6B & PHYS 6M
	EART 110A & EART 110L	EART 110B & EART 110M	EART 110C & EART 110N
	2nd (senior)	EART elective	EART elective
	EART elective	EART elective	EART elective
	(Sr thesis only) EART 199†	(Sr thesis only) EART 199†	EART 189A* or senior thesis (EART 195)†

*Students who wish to complete their capstone with EART 189A and EART 189B should be aware that the following courses are prerequisites: EART 109 and EART 109L, EART 110A and EART 110L, and EART 110B and EART 110M. Students must also complete EART 189B in summer to fulfill the summer field capstone.

†Students expecting to write a senior thesis for their comprehensive requirement are required to contact the department at least three quarters before graduation to identify the intended project and faculty advisor. Senior theses usually require at least two or three quarters for completion.

Geology Concentration

Course Requirements

Lower-Division Courses

All of the following courses:

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1M	General Chemistry Laboratory	2
CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2

Plus one of the following options:

Either these courses		
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5
or these courses		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
or these courses		
AM 15A	Case-Study Calculus I	5
AM 15B	Case-Study Calculus II	5

Plus all of the following courses:

PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 6B	Introductory Physics II	5
PHYS 6M	Introductory Physics II Laboratory	1

Plus one of the following options:

Either these courses		
EART 5	California Geology	5
EART 5L	California Geology Laboratory	1
or these courses		
EART 10	Geologic Principles	5
EART 10L	Geologic Principles Laboratory	1
or these courses		
EART 20	Environmental Geology	5
EART 20L	Environmental Geology Laboratory	1

Upper-Division Courses

All of the following courses:

EART 109	Elements of Field Geology	5
EART 109L	Field Geology Laboratory	2
EART 110A	Evolution of the Earth	5
EART 110L	Evolution of the Earth Laboratory	2
EART 110B	Earth as a Chemical System	5
EART 110M	Earth as a Chemical System Laboratory	2
EART 110C	The Dynamic Earth	5
EART 110N	The Dynamic Earth Laboratory	2

EART 120	Sedimentology and Stratigraphy	5
EART 120L	Sedimentology and Stratigraphy Laboratory	2
EART 150	Structural Geology	5
EART 150L	Structural Geology Laboratory	2

Geology Elective: One of the following:

Where the lab course follows a lecture course the pair of courses counts as a single course.

EART 100	Vertebrate Paleontology	5
EART 100L	Vertebrate Paleontology Laboratory	2
EART 101	Invertebrate Paleobiology	5
EART 101L	Invertebrate Paleobiology Laboratory	1
EART 140	Geomorphology	5
EART 140L	Geomorphology Laboratory	2
EART 142	Engineering Geology for Environmental Scientists	5
EART 146	Groundwater	5

Electives

At least two additional upper-division elective courses (5+ credits each) from Earth sciences or ocean sciences offerings must be completed. Students are encouraged to take more than the minimum number of elective courses and may craft an elective distribution from many areas of specific research and career interests.

EART 196B and EART 198 may not be used to satisfy this requirement.

No more than one quarter of EART 199 may be used to satisfy this requirement.

Lecture/lab combinations count as one course.

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division disciplinary communication (DC) general education requirement. Students in the Earth Sciences B.S. major must complete a minimum of two (2) courses from the list of courses that in combination satisfies the DC general education requirement. Courses taken to satisfy the DC requirement may also satisfy upper-division elective or senior comprehensive requirements. Consult one of the Earth and planetary sciences advisors for the most up-to-date list of scheduled classes.

Currently the list (subject to change) consists of:

EART 100	Vertebrate Paleontology	5
EART 101	Invertebrate Paleobiology	5
EART 102	Marine Geology	5
EART 104	Geologic Hazards	5
EART 109	Elements of Field Geology	5
EART 120	Sedimentology and Stratigraphy	5
EART 140	Geomorphology	5
EART 146	Groundwater	5

EART 148	Glaciology	5
EART 150	Structural Geology	5
EART 160	Planetary Science	5
EART 189B	Summer Field Study	5
EART 191A	Climate Change Science and Policy	5
EART 191C	Practical Geophysics	5
EART 195	Senior Thesis	5

Comprehensive Requirement

All students must satisfy the senior comprehensive requirement.

The intent of this requirement is to synthesize knowledge and skills from a student's undergraduate career and to provide the instructional hours in the field needed to prepare students for the California professional geologist licensing requirements. Therefore, prior to completing an activity to satisfy the senior comprehensive requirement, students should have already completed EART 110A, one of EART 110B or EART 110C, and three other upper-division courses that fulfill major requirements. Students should consult an advisor if they have any questions about the timing of their proposed comprehensive requirement activity.

Note: Courses used to satisfy the senior comprehensive requirement **cannot** also be used to fulfill the upper-division elective requirement.

To do so, each student in the geology concentration must complete:

Satisfactory completion of Summer Field

EART 189A	Geographic Information Systems with Applications in Earth Sciences	5
EART 189B	Summer Field Study	5

Planners

Students planning a professional career in the Earth and planetary sciences should take more than the minimum number of courses required for the major if possible. Four-year students have ample flexibility to take additional electives if they begin with the required courses in their second year. Junior transfers also have flexibility if they have taken most of their preparatory courses in calculus, chemistry, and physics before entry. Further advice can be obtained from the undergraduate advisor and from faculty members.

Sample Four-Year Planner

Year	Fall	Winter	Spring
1st (frosh)	CHEM 1A	MATH 11A or MATH 19A	CHEM 1C & CHEM 1N
	EART 5 &	CHEM 1B & CHEM 1M	MAT H 11B

	EART 5L		or MAT H 19B	
2nd (soph)	EART 110A & EART 100L	EART 110B & EART 110M	EART 109 & EART 109L	
		PHYS 6A & PHYS 6L	PHYS 6B & PHYS 6M	
3rd (junior)	Upper-division elective	Geology elective	EART 110C & EART 110N EART 120 & EART 120L	
4th (senior)	EART 150 & EART 150L	Upper-division elective	EART 189A*	

* Students must also complete EART 189B in summer to fulfill the summer field capstone.

Sample Two-Year Planner

This planner assumes that students have completed all lower-division requirements other PHYS 6A and PHYS 6L, PHYS 6B and PHYS 6M, and advanced math.

Year	Fall	Winter	Spring
1st (junior)	Geology elective EART 110A & EART 110L	PHYS 6A & PHYS 6L EART 110B & EART 110M	PHYS 6B & PHYS 6M EART 109 & EART 109L
2nd (senior)	EART 150 & EART 150L	Upper-division elective Upper-	EART 120 & EART 120L EART

division elective 110C & EART 110N
EART 189A*

*Students must also complete EART 189B in summer to fulfill the summer field capstone.

Planetary Sciences Concentration

The planetary sciences concentration is designed to provide students with a quantitative background appropriate for career pathways in the interdisciplinary study of planets and their satellites. The upper-division elective courses can be tailored for students interested in planetary interiors, atmospheres, and/or surfaces.

Course Requirements

Lower-Division Courses

Choose one of the following options:

Either these courses		
EART 10	Geologic Principles	5
EART 10L	Geologic Principles Laboratory	1
or these courses		
EART 5	California Geology	5
EART 5L	California Geology Laboratory	1
or these courses		
EART 20	Environmental Geology	5
EART 20L	Environmental Geology Laboratory	1

Plus all of the following courses:

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1M	General Chemistry Laboratory	2
CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 6B	Introductory Physics II	5
PHYS 6M	Introductory Physics II Laboratory	1

Plus one of the following options:

Either these courses		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

or these courses		
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5

or these courses		
AM 15A	Case-Study Calculus I	5
AM 15B	Case-Study Calculus II	5

Plus one of the following courses:

MATH 22	Introduction to Calculus of Several Variables	5
MATH 23A	Vector Calculus	5
EART 111	Mathematics in the Earth Sciences	5

Upper-Division Courses**All of the following courses:**

EART 110A	Evolution of the Earth	5
EART 110L	Evolution of the Earth Laboratory	2
EART 110B	Earth as a Chemical System	5
EART 110M	Earth as a Chemical System Laboratory	2
EART 110C	The Dynamic Earth	5
EART 110N	The Dynamic Earth Laboratory	2
EART 119	Introductory Computer Programming for Geoscientists	5
EART 160	Planetary Science	5

Plus one of the following:

One elective from the following planetary science courses:

EART 162	Planetary Interiors	5
EART 163	Planetary Surfaces	5
EART 164	Planetary Atmospheres	5
EART 165	History and Geochemistry of the Solar System	5

Electives

At least three electives from upper-division Earth sciences, ocean sciences, astronomy, or mathematics must be completed. Students are encouraged to take more than the minimum number of elective courses and may craft an elective distribution from many areas of specific research and career interests.

EART 196B and EART 198 may not be used to satisfy this requirement.

No more than one quarter of EART 199 may be used to satisfy this requirement.

Lecture/lab combinations count as one course.

Choosing from the following list is recommended, but not mandatory.

EART 107	Remote Sensing of the Environment	5
EART 109	Elements of Field Geology	5
EART 109L	Field Geology Laboratory	2
EART 116	Hydrology	5
EART 121	The Atmosphere	5
EART 128	Isotopes: Fundamentals and Applications in Earth and Marine Sciences	5
EART 130	Igneous and Metamorphic Petrology	5
EART 130L	Igneous and Metamorphic Petrology Laboratory	2
EART 140	Geomorphology	5
EART 140L	Geomorphology Laboratory	2
EART 148	Glaciology	5
EART 150	Structural Geology	5
EART 150L	Structural Geology Laboratory	2
EART 152	Tectonics	5
EART 162	Planetary Interiors	5
EART 163	Planetary Surfaces	5
EART 164	Planetary Atmospheres	5
EART 165	History and Geochemistry of the Solar System	5
EART 172	Geophysical Fluid Dynamics	5
ASTR 112	Physics of Stars	5
ASTR 118	Physics of Planetary Systems	5
MATH 130	Celestial Mechanics	5

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division disciplinary communication (DC) general education requirement. Students in the Earth Sciences B.S. major must complete a minimum of two (2) courses from the list of courses that in combination satisfies the DC general education requirement. Courses taken to satisfy the DC requirement may also satisfy upper-division elective or senior comprehensive requirements. Consult one of the Earth and planetary sciences advisors for the most up-to-date list of scheduled classes.

Currently the list (subject to change) consists of:

EART 100	Vertebrate Paleontology	5
EART 101	Invertebrate Paleobiology	5
EART 102	Marine Geology	5
EART 104	Geologic Hazards	5
EART 109	Elements of Field Geology	5
EART 120	Sedimentology and Stratigraphy	5
EART 140	Geomorphology	5
EART 146	Groundwater	5
EART 148	Glaciology	5
EART 150	Structural Geology	5
EART 160	Planetary Science	5
EART 189B	Summer Field Study	5
EART 191A	Climate Change Science and Policy	5

EART 191C	Practical Geophysics	5
EART 195	Senior Thesis	5

Comprehensive Requirement

All students must satisfy the senior comprehensive requirement. The intent of this requirement is to synthesize knowledge and skills from a student's undergraduate career. Therefore, prior to completing an activity to satisfy the senior comprehensive requirement, students should have already completed EART 110A, one of EART 110B or EART 110C, and three other upper-division courses that fulfill major requirements. Students should consult an advisor if they have any questions about the timing of their proposed comprehensive requirement activity.

Note: Courses used to satisfy the senior comprehensive requirement **cannot** also be used to fulfill the upper-division elective requirement.

To satisfy the comprehensive requirement, each student in these majors must complete one of the following options:

Satisfactory completion of Summer Field

EART 189A	Geographic Information Systems with Applications in Earth Sciences	5
EART 189B	Summer Field Study	5

Satisfactory completion of a senior thesis

A senior thesis must include a significant element of independent research or original work and can only be undertaken after an agreement is obtained from a faculty member to supervise it. It is recommended that students allocate three quarters for the thesis process.

Students may take EART 199: Independent Study, as part of performing the research for their senior thesis. It is required that each student enroll in and pass EART 195: Senior Thesis, in the academic quarter during which they complete their thesis.

Satisfactory completion of one of the following capstone course offerings:

EART 191A	Climate Change Science and Policy	5
EART 191B	Planetary Capstone	5
EART 191C	Practical Geophysics	5

Capstone course offerings vary year to year. If you are interested in completing a capstone course please contact the Earth sciences advisor.

Other options

Other options such as external field research experiences or internships may be suitable by permission of the faculty advisor.

Please meet with an advisor if you have an idea to propose.

Planners

Sample Four-Year Planner

Year	Fall	Winter	Spring
1st (frosh)	MATH 19A CHEM 1A	MATH 19B CHEM 1B & CHEM 1M	EART 10 & EART 10L CHEM 1C & CHEM 1N
2nd (soph)	EART 110A & EART 110L* PHYS 6A & PHYS 6L MATH 23A or EART 111	EART 110B & EART 110M* PHYS 6B & PHYS 6M	EART 110C & EART 110N EART elective
3rd (junior)	EART 160	EART 119	EART elective
4th (senior)	(Sr thesis only) EART 199†	(Sr thesis only) EART 199† EART 162	Sr thesis (EART 195)† or EART 189A* EART elective

*Students who wish to complete their capstone with EART 189A and EART 189B should be aware that the following courses are prerequisites: EART 109 and EART 109L, EART 110A and EART 110L, and EART 110B and EART 110M. Students must also complete EART 189B in summer to fulfill the summer field capstone.

† Students expecting to write a senior thesis for their comprehensive requirement are required to contact the department at least three quarters before graduation to identify the intended project and faculty advisor. Senior theses usually require two or three quarters for completion.

Sample Two-Year Planner

This planner assumes that students have completed all lower-division requirements other than PHYS 6A and PHYS 6L, PHYS 6B and PHYS 6M, and advanced math.

Year	Fall	Winter	Spring	or these courses		
1st (junior)	EART 111	PHYS 6A & PHYS 6L	PHYS 6B & PHYS 6M	EART 20 EART 20L	Environmental Geology Environmental Geology Laboratory	5 1
	EART 110A & EART 110L*	EART 110B & EART 110M*	EART 110C & EART 110N	Plus all of the following courses:		
				Where the lab course follows a lecture course the pair of courses counts as a single course.		
				BIOE 20C	Ecology and Evolution	5
				CHEM 1A	General Chemistry	5
				CHEM 1B	General Chemistry	5
				CHEM 1M	General Chemistry Laboratory	2
				CHEM 1C	General Chemistry	5
				CHEM 1N	General Chemistry Laboratory	2
2nd (senior)	EART 160	EART 162	EART 119	PHYS 6A PHYS 6L	Introductory Physics I Introductory Physics I Laboratory	5 1
	EART elective	EART elective	EART elective	PHYS 6B PHYS 6M	Introductory Physics II Introductory Physics II Laboratory	5 1
	(Sr thesis only) EART 199†	(Sr thesis only) EART 199†	EART 189A* or sr thesis (EART 195)†	Plus one of the following options:		
					Either these courses	
				MATH 11A	Calculus with Applications	5
				MATH 11B	Calculus with Applications	5
				or these courses		
				MATH 19A	Calculus for Science, Engineering, and Mathematics	5
				MATH 19B	Calculus for Science, Engineering, and Mathematics	5
				or these courses		
				AM 15A	Case-Study Calculus I	5
				AM 15B	Case-Study Calculus II	5
				Plus one of the following courses:		
				MATH 22	Introduction to Calculus of Several Variables	5
				MATH 23A	Vector Calculus	5
				EART 111	Mathematics in the Earth Sciences	5

*Students who wish to complete their capstone with EART 189A and EART 189B should be aware that the following courses are prerequisites: EART 109 and EART 109L, EART 110A and EART 110L, and EART 110B and EART 110M. Students must also complete EART 189B in summer to fulfill the summer field capstone.

†Students expecting to write a senior thesis for their comprehensive requirement are required to contact the department at least three quarters before graduation to identify the intended project and faculty advisor. Senior theses usually require at least two or three quarters for completion.

Ocean Sciences Concentration

The ocean sciences concentration is intended to provide quantitative preparation for career pathways that include oceanography and biogeochemistry. Additional biology and chemistry courses are required for this concentration along with other distributions of upper-division requirements and electives.

Course Requirements

Lower-Division Courses

Choose one of the following options:

Either these courses			
EART 5	California Geology		5
EART 5L	California Geology Laboratory		1
or these courses			
EART 10	Geologic Principles		5
EART 10L	Geologic Principles Laboratory		1

Upper-Division Courses

All of the following courses:

EART 110A	Evolution of the Earth	5
EART 110L	Evolution of the Earth Laboratory	2
EART 110B	Earth as a Chemical System	5
EART 110M	Earth as a Chemical System Laboratory	2
EART 110C	The Dynamic Earth	5

EART 110N	The Dynamic Earth Laboratory	2
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Plus one of the following courses:

OCEA 101	The Marine Environment	5
OCEA 102	Oceans and Climate: Past, Present, and Future	5

Electives

At least four elective courses from upper-division Earth sciences or ocean sciences offerings must be completed. Students are encouraged to take more than the minimum number of elective courses and may craft an elective distribution from many areas of specific research and career interests.

EART 196B and EART 198 may not be used to satisfy this requirement.

No more than one quarter of EART 199 may be used to satisfy this requirement.

Lecture/lab combinations count as one course.

Choosing from the following list is recommended, but not mandatory:

EART 101	Invertebrate Paleobiology	5
EART 101L	Invertebrate Paleobiology Laboratory	1
EART 102	Marine Geology	5
EART 105	Coastal Geology	5
EART 107	Remote Sensing of the Environment	5
EART 109	Elements of Field Geology	5
EART 109L	Field Geology Laboratory	2
EART 111	Mathematics in the Earth Sciences	5
EART 116	Hydrology	5
EART 119	Introductory Computer Programming for Geoscientists	5
EART 120	Sedimentology and Stratigraphy	5
EART 120L	Sedimentology and Stratigraphy Laboratory	2
EART 121	The Atmosphere	5
EART 128	Isotopes: Fundamentals and Applications in Earth and Marine Sciences	5
EART 130	Igneous and Metamorphic Petrology	5
EART 130L	Igneous and Metamorphic Petrology Laboratory	2
EART 148	Glaciology	5
EART 172	Geophysical Fluid Dynamics	5
OCEA 100	Physical Oceanography	5
OCEA 101	The Marine Environment	5
OCEA 102	Oceans and Climate: Past, Present, and Future	5
OCEA 111	Climate Dynamics	5
OCEA 118	Marine Microbial Ecology	5

OCEA 120	Aquatic Chemistry: Principles and Applications	5
OCEA 121	Aqueous Geochemistry	5
OCEA 122	Chemical Oceanography	5
OCEA 124	Aquatic Organic Geochemistry	5
OCEA 130	Biological Oceanography	5

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division disciplinary communication (DC) general education requirement. Students in the Earth Sciences B.S. major must complete a minimum of two (2) courses from the list of courses that in combination satisfies the DC general education requirement. Courses taken to satisfy the DC requirement may also satisfy upper-division elective or senior comprehensive requirements. Consult one of the Earth and planetary sciences advisors for the most up-to-date list of scheduled classes.

Currently the list (subject to change) consists of:

EART 100	Vertebrate Paleontology	5
EART 101	Invertebrate Paleobiology	5
EART 102	Marine Geology	5
EART 104	Geologic Hazards	5
EART 109	Elements of Field Geology	5
EART 120	Sedimentology and Stratigraphy	5
EART 140	Geomorphology	5
EART 146	Groundwater	5
EART 148	Glaciology	5
EART 150	Structural Geology	5
EART 160	Planetary Science	5
EART 189B	Summer Field Study	5
EART 191A	Climate Change Science and Policy	5
EART 191C	Practical Geophysics	5
EART 195	Senior Thesis	5

Comprehensive Requirement

All students must satisfy the senior comprehensive requirement. The intent of this requirement is to synthesize knowledge and skills from a student's undergraduate career. Therefore, prior to completing an activity to satisfy the senior comprehensive requirement, students should have already completed EART 110A, one of EART 110B or EART 110C, and three other upper-division courses that fulfill major requirements. Students should consult an advisor if they have any questions about the timing of their proposed comprehensive requirement activity.

Note: Courses used to satisfy the senior comprehensive requirement **cannot** also be used to fulfill the upper-division elective requirement.

To satisfy the comprehensive requirement, each student in these majors must complete one of the following options:

Satisfactory completion of Summer Field

EART 189A	Geographic Information Systems with Applications in Earth Sciences	5
EART 189B	Summer Field Study	5

Satisfactory completion of a senior thesis

A senior thesis must include a significant element of independent research or original work and can only be undertaken after an agreement is obtained from a faculty member to supervise it. It is recommended that students allocate three quarters for the thesis process.

Students may take EART 199: Independent Study, as part of performing the research for their senior thesis. It is required that each student enroll in and pass EART 195: Senior Thesis, in the academic quarter during which they complete their thesis.

Satisfactory completion of one of the following capstone course offerings:

EART 191A	Climate Change Science and Policy	5
EART 191B	Planetary Capstone	5
EART 191C	Practical Geophysics	5

Capstone course offerings vary year to year. If you are interested in completing a capstone course please contact the Earth sciences advisor.

Other options

Other options such as external field research experiences or internships may be suitable by permission of the faculty advisor.

Please meet with an advisor if you have an idea to propose.

Planners

Sample Four-Year Planner

Year	Fall	Winter	Spring
1st (frosh)	CHEM 1A	CHEM 1B & CHEM 1M	EART 10 & EART 10L
		MATH 11A or MATH 19A	CHEM 1C & CHEM 1N
			MATH 11B or MATH 19B
2nd (soph)	EART 110A & EART 110L*	EART 110B & EART 110M*	EART 110C & EART 110N
	MATH 23A or	PHYS 6A & PHYS	PHYS 6B & PHYS

	EART 111	6L	6M
3rd (junior)	EART elective	OCEA 101	EART elective
	BIOE 20C	EART elective	
4th (senior)	(Sr thesis only) EART 199†	EART elective	
		(Sr thesis only) EART 199†	Senior thesis (EART 195)† or EART 189A*

*Students who wish to complete their capstone with EART 189A and EART 189B should be aware that the following courses are prerequisites: EART 109 and EART 109L, EART 110A and EART 110L, and EART 110B and EART 110M. Students must also complete EART 189B in summer to fulfill the summer field capstone.

† Students expecting to write a senior thesis for their comprehensive requirement are required to contact the department at least three quarters before graduation to identify the intended project and faculty advisor. Senior theses usually require two or three quarters for completion.

Sample Two-Year Planner

This planner assumes that students have completed all lower-division requirements other PHYS 6A and PHYS 6L, PHYS 6B and PHYS 6M, and advanced math.

Year	Fall	Winter	Spring
1st (junior)	EART 111	PHYS 6A & PHYS 6L	PHYS 6B & PHYS 6M
	EART 110A & EART 110L	EART 110B & EART 110M	EART 110C & EART 110N
	2nd (senior)	EART elective	EART elective
	EART elective	OCEA 101	EART 189A* or senior thesis

	(EART 195)†
(Sr thesis only) EART 199†	(Sr thesis only) EART 199†

*Students who wish to complete their capstone with EART 189A and EART 189B should be aware that the following courses are prerequisites: EART 109 and EART 109L, EART 110A and EART 110L, and EART 110B and EART 110M. Students must also complete EART 189B in summer to fulfill the summer field capstone.

†Students expecting to write a senior thesis for their comprehensive requirement are required to contact the department at least three quarters before graduation to identify the intended project and faculty advisor. Senior theses usually require at least two or three quarters for completion.

Geophysics Concentration

The geophysics concentration provides quantitative, rigorous instruction in the geophysical sciences. Solid Earth geophysics is an internationally recognized field that includes seismology, geodesy, geodynamics and applied methods to image the Earth's interior. All of these subdisciplines have in common a strong mathematical, physical, and computational underpinning, and students wishing to pursue these subjects need training in mathematics, physics, and computer science as well as geosciences. This program will guide students through these fundamentals and then train them to apply the tools to problems in geophysics. Graduates will be prepared to pursue careers in natural hazard research and mitigation, the energy industry, or environmental consultancy.

Course Requirements

Lower-Division Courses

All of the following courses:

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1M	General Chemistry Laboratory	2
CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 6B	Introductory Physics II	5
PHYS 6M	Introductory Physics II Laboratory	1

Plus one of the following options:

Either these courses		
EART 5	California Geology	5

EART 5L	California Geology Laboratory	1
or these courses		
EART 10	Geologic Principles	5
EART 10L	Geologic Principles Laboratory	1
or these courses		
EART 20	Environmental Geology	5
EART 20L	Environmental Geology Laboratory	1

Plus one of the following options:

Either these courses		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
or these courses		
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5

MATH 19A and MATH 19B are strongly preferred.

Plus one of the following courses:

MATH 22	Introduction to Calculus of Several Variables	5
MATH 23A	Vector Calculus	5
EART 111	Mathematics in the Earth Sciences	5

Plus one of the following courses:

MATH 21	Linear Algebra	5
AM 10	Mathematical Methods for Engineers I	5

Upper-Division Courses

All of the following courses:

EART 110A	Evolution of the Earth	5
EART 110L	Evolution of the Earth Laboratory	2
EART 110B	Earth as a Chemical System	5
EART 110M	Earth as a Chemical System Laboratory	2
EART 110C	The Dynamic Earth	5
EART 110N	The Dynamic Earth Laboratory	2

Plus one of these courses:

One of these courses		
EART 112	Geophysical Data Science	5
EART 119A	Introduction to Scientific Programming	5

Plus one of these courses:

One of these courses

EART 118	Seismotectonics	5
EART 126	Geomechanics	5
EART 162	Planetary Interiors	5

Electives

At least four additional electives (5+ credits each) from upper-division Earth sciences or upper level math or physics courses (see below) are required. Where the lab course follows a lecture course, the pair of courses counts as a single course.

EART 191C, EART 195, and EART 198 may not be used to satisfy this requirement.

Choosing from the following list is recommended, but not mandatory:

EART 104	Geologic Hazards	5
EART 107	Remote Sensing of the Environment	5
EART 109	Elements of Field Geology	5
EART 109L	Field Geology Laboratory	2
EART 116	Hydrology	5
EART 118	Seismotectonics	5
EART 125	Statistics and Data Analysis in the Geosciences	5
EART 140	Geomorphology	5
EART 142	Engineering Geology for Environmental Scientists	5
EART 146	Groundwater	5
EART 148	Glaciology	5
EART 150	Structural Geology	5
EART 152	Tectonics	5
EART 160	Planetary Science	5
EART 162	Planetary Interiors	5
EART 163	Planetary Surfaces	5
EART 164	Planetary Atmospheres	5
EART 165	History and Geochemistry of the Solar System	5
EART 172	Geophysical Fluid Dynamics	5
EART 270	Global Seismology	5
EART 273	Earthquake Physics	5
EART 278A	Advanced Seismology	5

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division disciplinary communication (DC) general education requirement. Students in the Earth Sciences B.S. major must complete a minimum of two (2) courses from the list of courses that in combination satisfies the DC general education requirement. Courses taken to satisfy the DC requirement may also satisfy upper-division elective or senior comprehensive requirements. Consult one of the Earth and planetary sciences advisors for the most up-to-date list of scheduled classes. Currently the list (subject to change) consists of:

EART 100	Vertebrate Paleontology	5
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EART 101	Invertebrate Paleobiology	5
EART 102	Marine Geology	5
EART 104	Geologic Hazards	5
EART 109	Elements of Field Geology	5
EART 120	Sedimentology and Stratigraphy	5
EART 140	Geomorphology	5
EART 146	Groundwater	5
EART 148	Glaciology	5
EART 150	Structural Geology	5
EART 160	Planetary Science	5
EART 189B	Summer Field Study	5
EART 191A	Climate Change Science and Policy	5
EART 191C	Practical Geophysics	5
EART 195	Senior Thesis	5

Comprehensive Requirement

All students must satisfy the senior comprehensive requirement.

The intent of this requirement is to synthesize knowledge and skills from a student's undergraduate career. Therefore, prior to completing an activity to satisfy the senior comprehensive requirement, students should have already completed EART 110A, EART 110B, and EART 110C, and three other upper-division courses that fulfill major requirements. Students should consult an advisor if they have any questions about the timing of their proposed comprehensive requirement activity.

Note: Courses used to satisfy the senior comprehensive requirement **cannot** also be used to fulfill the upper-division elective requirement.

To do so, each student in the geophysics concentration must complete one of the following capstone options:

Satisfactory Completion of Summer Field

EART 189A	Geographic Information Systems with Applications in Earth Sciences	5
EART 189B	Summer Field Study	5

Satisfactory completion of a senior thesis

A senior thesis must include a significant element of independent research or original work and can only be undertaken after an agreement is obtained from a faculty member to supervise it. It is recommended that students allocate three quarters for the thesis process.

Students may take EART 199: Independent Study, as part of performing the research for their senior thesis. It is required that each student enroll in and pass EART 195: Senior Thesis, in the academic quarter during which they complete their thesis.

Satisfactory completion of one of the following

capstone course offerings:

EART 191A	Climate Change Science and Policy	5
EART 191B	Planetary Capstone	5
EART 191C	Practical Geophysics	5

only)

(Sr thesis
only)
EART
199†
Senior
thesis
(EART
195)†
or EART
189A*

Capstone course offerings vary year to year. If you are interested in completing a capstone course please contact the Earth sciences advisor.

Other options

Other options such as external field research experiences or internships may be suitable by permission of the faculty advisor.

Please meet with an advisor if you have an idea to propose.

Planners**Sample Four-Year Planner**

Year	Fall	Winter	Spring
1st (frosh)	CHEM 1A	CHEM 1B & CHEM 1M	EART 20 & EART 20L
		MATH 11A or MATH 19A	CHEM 1C & CHEM 1N
			MATH 11B or MATH 19B
2nd (soph)	EART 110A & EART 110L*	EART 110B & EART 110M*	EART 110C & EART 110N
	MATH 23A or EART 111	PHYS 6A & PHYS 6L	PHYS 6B & PHYS 6M
	EART 119	AM 10	
3rd (junior)	EART elective	OCEA 101	EART elective
	BIOE 20C	EART elective	
		EART 118 or EART 126 or EART 162	
4th (senior)	EART 191C or EART 199† (Sr thesis	EART elective	

*Students who wish to complete their capstone with EART 189A and EART 189B should be aware that the following courses are prerequisites: EART 109 and EART 109L, EART 110A and EART 110L, and EART 110B and EART 110M. Students must also complete EART 189B in summer to fulfill the summer field capstone.

† Students expecting to write a senior thesis for their comprehensive requirement are required to contact the department at least three quarters before graduation to identify the intended project and faculty advisor. Senior theses usually require two or three quarters for completion.

Sample Two-Year Planner

This planner assumes that students have completed all lower-division requirements except PHYS 6A and PHYS 6L, PHYS 6B and PHYS 6M, and advanced math.

Year	Fall	Winter	Spring
1st (junior)	MATH 23A or EART 111	PHYS 6A & PHYS 6L	PHYS 6B & PHYS 6M
	EART 110A & EART 110L	EART 110B & EART 110M	EART 110C & EART 110N
	EART 119	EART 118 or EART 126 or EART 162	AM 10
2nd (senior)	EART elective	EART elective	EART elective
	EART elective	(Sr thesis only) EART 199†	EART 189A* or senior thesis (EART 195)†
	EART 191C or EART 199† (Sr		

thesis
only)

*Students who wish to complete their capstone with EART 189A and EART 189B should be aware that the following courses are prerequisites: EART 109 and EART 109L, EART 110A and EART 110L, and EART 110B and EART 110M. Students must also complete EART 189B in summer to fulfill the summer field capstone.

†Students expecting to write a senior thesis for their comprehensive requirement are required to contact the department at least three quarters before graduation to identify the intended project and faculty advisor. Senior theses usually require at least two or three quarters for completion.

ENVIRONMENTAL SCIENCES B.S.

Information and Policies

Introduction

The UC Santa Cruz environmental sciences (ESCI) major is an interdepartmental, undergraduate-only program. The purpose of the ESCI major is to educate students interested in environmental science problems and issues, with a focus on issues within the physical sciences (as opposed to focusing on biological sciences). The major specializes primarily on the following areas:

- Hydrosphere: water resources, water quality, aquatic chemistry, physical oceanography, chemical oceanography, glaciology
- Pollution and transport: environmental toxicology, environmental transport/fluid mechanics, environmental monitoring
- Global scale environment: climate, climate dynamics, global cycles of water, carbon and nutrients, remote sensing of the environment
- Atmosphere: meteorology, air quality, atmospheric chemistry

The core faculty of the major are primarily from two departments, Earth and Planetary Sciences and Ocean Sciences. Faculty from other departments such as Microbiology and Environmental Toxicology and Environmental Studies may also be involved.

Graduates of the ESCI major are expected to continue on to a variety of careers, such as:

- Business and industry
- Environmental consulting
- Governmental agencies at the federal, state, and local level

- Non-profit organizations
- Research at universities, governmental research institutions, or other scientific agencies
- Graduate/professional school in areas such as science, engineering, teaching, law, public health, business

For more information about the affiliated faculty and staff for the major, including areas of interest and facilities, contact e-mails and phone numbers, and how to declare this major, please see our web site.

Academic Advising for the Program

A student who wants to become an ESCI major should contact the environmental sciences undergraduate staff advisor, epsadvising@ucsc.edu, as soon as possible. Students will submit a declaration of major petition, and are required to meet with the undergraduate advisor to plan their program in detail. Transfer students should consult the Transfer Information and Policy section for more detailed information about academic advising.

Getting Started in the Major

The bachelor of science (B.S.) program is designed for students who intend to pursue professional careers in environmental sciences, engineering, policy, law, teaching, or business or who otherwise desire the broad, quantitative training available at UC Santa Cruz. In addition to providing comprehensive preparation in the basic physical sciences, and particular breadth and depth in environmental sciences, the curriculum is structured to prepare students for the competitive graduate school and career marketplace.

The core of the major includes calculus, physics, chemistry, and core foundational upper-division environmental sciences courses. Students also select at least five additional courses from a diverse list of upper-division electives. These electives provide the student with expertise in one or more subdisciplines within environmental sciences. A senior comprehensive experience is required of all majors, and may be fulfilled in two ways, either completion of an intensive senior seminar course or a senior thesis.

Program Learning Outcomes

The ESCI major has three broad program learning outcomes, each with three specific learning outcomes:

PLO 1: Disciplinary Knowledge Goals

- Reservoirs: Understand and describe the properties of the various environmental “reservoirs”, which represent different, interacting physical regimes. For example, a global model might have the atmosphere, oceans, plants and soils as four primary interacting reservoirs.
- Processes: Understand and describe the processes governing the properties and evolution of Earth’s

physical environment, i.e., the properties and evolution of reservoirs and their interactions.

- Application: Apply the knowledge of reservoirs and processes to explain, analyze and predict phenomena within the environmental sciences.

PLO 2: Quantitative Reasoning Goals

- Calculation: Utilize mathematical tools (e.g. algebra, calculus) to address questions in the environmental sciences.
- Visualization: Interpret and produce visual representations of data in the environmental sciences (e.g. graphs and charts) that conform to disciplinary standards.
- Analysis: Use quantitative analysis as the basis for drawing insights and conclusions, while expressing the appropriate assumptions and qualifications.

PLO 3: Written Communication Goals

- Mechanics: Write sentences with correct grammar, punctuation and spelling.
- Conventions: Accurately utilize the formatting, stylistic, citation and bibliographic conventions of environmental sciences in the written document.
- Organization: Construct paragraphs, sections and an overall document that flows logically and persuasively argues a thesis.

Major Qualification Policy and Declaration Process

Major Qualification

Transfer students should consult the Transfer and Information Policy section for information about major qualification.

To qualify for the environmental sciences major, a student must complete (with a minimum grade of C) the following introductory courses:

CHEM 1A	General Chemistry	5
CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1

Appeal Process

Students who are informed that they are not eligible to declare the major may appeal by submitting a letter to the environmental sciences advisor, epsadvising@ucsc.edu, within 15 days from the date the notification was sent. Within 15 days of receipt of the

appeal, the department will notify the student and their affiliated college of the decision.

How to Declare a Major

Students who qualify start the declaration process by scheduling an appointment with the department staff advisor. You must consult with the department's undergraduate staff advisor to discuss options for the degree and coursework priorities before you start the process of officially declaring your major.

Transfer Information and Policy

Transfer Admission Screening Policy

The environmental sciences program welcomes applications from prospective transfer students. Students should reference assist.org to determine course equivalencies.

The following courses or their equivalents are required prior to transfer, by the end of the spring term for students planning to enter in the fall.

CHEM 1A	General Chemistry	5
CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1

A minimum GPA of 2.00 must be obtained in the courses listed above.

Recommended Courses

In addition, the following courses are recommended prior to transfer to ensure timely graduation:

PHYS 6B	Introductory Physics II	5
PHYS 6M	Introductory Physics II Laboratory	1

Getting Started at UCSC as a Transfer Student

Whether you are planning for your future transfer or are already admitted to UC Santa Cruz, we aim to provide our transfer students the information and support needed to successfully complete a science degree at UC Santa Cruz.

If you are planning on transferring to UC Santa Cruz to pursue an environmental sciences major, our Transfer Preparation information provides a list of the coursework you should complete prior to transfer. Completing coursework prior to transfer allows you more time and flexibility to take advantage of the educational opportunities our programs provide and can reduce the cost of your education. For more information please visit Transfer Preparation.

For information regarding applying for admission to UC Santa Cruz as a transfer student, visit the UCSC Admissions web site.

Once you have submitted your intent to register at UC Santa Cruz, here is a step-by-step guide to transferring your coursework and getting enrolled:

- 1. Confirm you are a proposed environmental sciences major.**
If you are not sure of your status, log on to your MyUCSC portal to view your proposed major. If your major is proposed environmental sciences you are all set. If the proposed major listed is not environmental sciences, you will need to meet with the advisor for environmental sciences to determine if you are eligible for the major.
- 2. Once your courses have been articulated, you will receive an email from our office.**
This email will include information on how your coursework articulated, suggestions for fall enrollment, and invite you to make an appointment to talk with your major advisor.
- 3. Make an appointment to talk to an advisor.**
Your confirmation email will include instructions for scheduling an advising appointment. Appointments are available either by phone or in person.
- 4. Participate in Transfer Orientation and Welcome Week.**
Transfer Orientation provides instructions on how to transfer your coursework to UC Santa Cruz, the advising and support available, and how to enroll. Our online transfer orientation provides all the critical information you need to transition to UC Santa Cruz and begin your major coursework. The department also hosts a transfer student welcome in the fall that provides new transfer students an opportunity to meet other transfer students, familiarize themselves with the campus and the available resources. Welcome Week includes presentations on the environmental sciences major, including an overview of the field courses offered and an introduction on how to get involved in undergraduate research.
- 5. Declaring the environmental sciences major.**
In order to declare the environmental sciences major transfer students entering at the junior level must complete CHEM 1A, CHEM 1C and CHEM 1N, MATH 11A, MATH 11B, and PHYS 6A and PHYS 6L or an approved equivalent course (with a C or better) by the end of their first quarter at UC Santa Cruz and meet with the Environmental Sciences advisor by the declaration deadline.

Letter Grade Policy

All courses used to satisfy requirements for the environmental sciences major must be taken for a letter grade, with the exception of the following courses, which

may be taken pass/no pass: ESCI 195 Senior Thesis, EART 198 Earth Sciences Internship, and EART 199 Tutorial.

[Optional Catchall]

Course Substitution Policy

Relevant courses taken at UC Santa Cruz or other institutions may be substituted for degree requirements by approved petition. Please see the undergraduate advisor for the substitution petition form and more information about this process.

Double Majors and Major/Minor Combinations Policy

Study Abroad

Honors

Honors in the major are determined by a review of grades (typically 3.50 or above) at the time a student applies for graduation. A faculty committee makes the decision based on the quality of all coursework, but especially in the courses required for the major. Extra coursework or independent study as well as more intensive or rigorous coursework and the quality of a capstone project may also be taken into consideration. Highest honors may also be awarded in exceptional cases when a student's overall grade point average (GPA) is above 3.75 and performance in the senior capstone requirement is equally outstanding. The program reserves the right to withhold honors and highest honors based on other criteria, such as an incident of academic dishonesty.

Honors in the senior thesis are determined independently of major honors, and must be approved by two faculty readers.

[Optional Catchall]

Requirements and Planners

Course Requirements

Lower-Division Courses

All of the following courses:

CHEM 1A	General Chemistry	5
CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2

Plus one of the following options:

Either these courses		
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5

or these courses

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
or these courses		
AM 15A	Case-Study Calculus I	5
AM 15B	Case-Study Calculus II	5

Plus one of the following options:

Either these courses		
EART 5	California Geology	5
EART 5L	California Geology Laboratory	1
or these courses		
EART 10	Geologic Principles	5
EART 10L	Geologic Principles Laboratory	1
or these courses		
EART 20	Environmental Geology	5
EART 20L	Environmental Geology Laboratory	1

Plus all of the following courses:

ENVS 25	Environmental Policy and Economics	5
ESCI 30	Biological Principles of Environmental Sciences	5
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 6B	Introductory Physics II	5
PHYS 6M	Introductory Physics II Laboratory	1

* ESCI 30 students who were formerly proposed or declared majors in biology, biochemistry, bioengineering, or other related majors may have other options to fulfill this requirement. Please inquire with the advisor.

Upper-Division Courses**All of the following courses:**

ESCI 100A	Introduction to Environmental Sciences	5
ESCI 100B	Introduction to Environmental Processes	5
ESCI 160	Data Analysis in the Environmental Sciences	5

At least five elective courses.

At least five elective courses from upper-division Earth sciences, environmental sciences or ocean sciences offerings must be completed.

NOTE: Lecture/lab combinations count as one course. Courses from other departments may also be considered for upper-division elective credit by permission of a

faculty advisor. Please consult with an advisor for more details.

Students are encouraged to take more than the minimum number of elective courses and may craft an elective distribution from many areas of specific research and career interests.

Disciplinary Communication (DC) Requirement

Students fulfill the disciplinary communication (DC) requirement through successful completion of either (1) one of the environmental sciences senior capstone seminars (ESCI 191) or (2) a senior thesis based on original research performed by the student (completion of ESCI 195: Senior Thesis is required).

ESCI 191	Capstone Seminar	5
OR		
ESCI 195	Senior Thesis	5

Comprehensive Requirement

All students must satisfy the senior comprehensive requirement. The intent of this requirement is to synthesize knowledge and skills from a student's undergraduate career. Students should consult an advisor if they have any questions about the timing of their proposed comprehensive requirement activity.

Other capstones will not be considered unless they also satisfy the DC requirement.

Courses that are used to satisfy the capstone may not also count toward fulfilling the upper-division elective requirement.

Satisfactory completion of one of the following capstone course offerings:**Senior Thesis**

ESCI 195	Senior Thesis	5
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ESCI 195 requires original research performed by the student. Approval from a faculty sponsor is required prior to embarking on a senior thesis. Completion of the senior thesis is necessary to pass ESCI 195.

ESCI 195 also satisfies the DC requirement.

Capstone Seminar

ESCI 191	Capstone Seminar	5
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Enrollment in ESCI 191 is limited to environmental science majors with senior standing.

ESCI 191 also satisfies the DC requirement.

Planners

Students planning a professional career in environmental sciences should take more than the minimum number of courses required for the major, if possible. Four-year students have ample flexibility to take additional electives if they begin with the required courses in their second year. Junior transfers also have flexibility if they have taken most of their lower-division preparatory courses

before entry. Further advice can be obtained from the undergraduate advisor and from faculty members.

Sample Four-Year Planner

Note: CHEM 1A, CHEM 1B and CHEM 1M, CHEM 1C and CHEM 1N, and MATH 11A and MATH 11B are offered every quarter. PHYS 6A and PHYS 6L are offered every quarter, but PHYS 6B and PHYS 6M are not offered in fall.

Year	Fall	Winter	Spring
1st (frosh)	CHEM 1A	MATH 11A CHEM 1C & CHEM 1N	EART 20 & EART 20L MATH 11B
2nd (soph)	ESCI 30 PHYS 6A & PHYS 6L	ESCI 100A PHYS 6B & PHYS 6M	ESCI 100B Upper-division elective
3rd (junior)	ESCI 160	ENVS 25 Upper-division elective	Upper-division elective
4th (senior)	Upper-division elective	Upper-division elective	ESCI 191 or ESCI 195†

In addition to the specific courses shown in these planners, a student must complete courses satisfying the CC, ER, IM, SR, TA, PE, and PR general education requirements.

†Students expecting to write a senior thesis (ESCI 195) for their comprehensive requirement should contact the department at least three quarters before graduation to identify the intended project and faculty advisor. Senior theses usually require at least three quarters for completion.

Sample Transfer (Two-Year) Planner

This planner assumes that students have completed all lower-division requirements other than ESCI 30, ENVS 25, and EART 20 and EART 20L.

Year	Fall	Winter	Spring
3rd (junior)	ESCI 30 ESCI 160	ENVS 25 ESCI 100A	ESCI 100B EART 20 & EART 20L
4th (senior)	Upper-division elective Upper-division elective	Upper-division elective Upper-division elective	ESCI 191 or ESCI 195† Upper-division elective

†Students expecting to write a senior thesis (ESCI 195) for their comprehensive requirement should contact the department at least three quarters before graduation to identify the intended project and faculty advisor. Senior theses usually require at least three quarters for completion.

EARTH SCIENCES/ANTHROPOLOGY COMBINED MAJOR B.A.

Information and Policies

Introduction

The Earth sciences/anthropology combined major is intended for students with interests in Earth sciences and the laboratory-based aspect of anthropology. These include anthropology students interested in archaeology or paleoanthropology who desire more intensive training in natural sciences and Earth sciences students interested in paleobiology or archaeology. The combined major provides a rigorous training in both anthropology and Earth sciences and will permit students to enter graduate programs in Earth sciences, archaeology, or paleoanthropology. The combined major has a significantly different set of cognate science and required lower- and upper-division courses than the standard major; therefore, students are advised to plan carefully and to contact academic advisors in the Earth and Planetary Sciences and Anthropology departments early if they have questions.

Academic Advising for the Program

A student who wants to become an Earth sciences/anthropology combined major should contact the Earth and Planetary Sciences Department undergraduate staff advisor, epsadvising@ucsc.edu, as soon as possible. Students will submit a declaration of major petition, and are required to meet with the undergraduate advisor to plan their program in detail. Transfer students should

consult the Transfer Information and Policy section for more detailed information about academic advising.

Getting Started in the Major

Welcome! Now that you are a registered freshman, the following information is your guide to getting started in your Earth sciences major.

All freshmen are required to complete summer orientation, for more information visit Campus Orientation Programs. Our freshmen orientation includes everything you need to know to get started on your Earth science major. If you have already completed orientation and simply need a refresher on getting enrolled, see our Freshmen Enrollment Guide.

Students with advanced placement credit must provide Admissions an official copy of your test score. You can verify your AP credit in your MyUCSC portal. For information on how your AP credit applies to your enrollment and your major, see our advanced placement credit page. If you have taken a college-level course that you would like credit for, you must send an official transcript to Admissions. If you wish to have that same course applied toward your major requirements, send an unofficial copy of your transcripts to epsadvising@ucsc.edu.

If you have already been admitted to UC Santa Cruz as a transfer student, our transfer orientation provides instructions on how to transfer your coursework to UC Santa Cruz, the advising and support available, and how to enroll. Our online transfer orientation provides all the critical information you need to transition to UC Santa Cruz and begin your major coursework.

Program Learning Outcomes

Students graduating with a B.A. in Earth sciences/anthropology should be able to:

1. understand the processes governing the properties and evolution of Earth's interior and surface;
2. identify rocks and minerals, and describe their connection to geologic processes;
3. utilize algebraic mathematical tools to quantitatively address questions in the geosciences; and
4. write in a clear, organized, and logical fashion using disciplinary standards for reporting and citation.

Major Qualification Policy and Declaration Process

Major Qualification

To qualify for the combined Earth sciences and anthropology major, a student must complete (with a minimum grade of C) one of the following introductory courses in physical geology:

EART 5	California Geology	5
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EART 10	Geologic Principles	5
EART 20	Environmental Geology	5

Transfer students may take an approved substitution for one of the above courses and should consult assist.org for equivalencies and the Transfer and Information Policy section for information about major qualifications.

Appeal Process

If a student completes major qualification courses but does not meet the major qualification criteria, and appeals, the department may accept or reject the appeal or place conditions on the student that will be resolved within at most one more enrolled quarter.

Students who are informed that they are not eligible to declare the major may appeal by submitting a letter to the Earth and Planetary Sciences advisor within 15 days from the date the notification was sent. Within 15 days of receipt of the appeal, the department will notify the student and their affiliated college of the decision.

How to Declare a Major

Students who wish to declare the Earth science major start the process by scheduling an appointment with the department staff advisor to create an academic plan. Once academic planning has been completed students submit the online major declaration petition to begin the major declaration process. Students are expected to complete the academic planning and online petition by the campus declaration deadline.

Transfer Information and Policy

Transfer Admission Screening Policy

The Earth and Planetary Sciences Department welcomes applications from prospective transfer students who are prepared for the major. Students should reference assist.org to determine course equivalencies.

No major preparation courses are required prior to transfer; however, the following courses or their equivalents are recommended to ensure timely graduation:

One of the following options:

Either these courses		
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5
or these courses		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

All of the following courses:

ANTH 1	Introduction to Biological Anthropology	5
ANTH 2	Introduction to Cultural Anthropology	5
ANTH 3	Introduction to Archaeology	5

Plus one of the following options:

EART 5	California Geology	5
EART 5L	California Geology Laboratory	1
	OR	
EART 10	Geologic Principles	5
EART 10L	Geologic Principles Laboratory	1
	OR	
EART 20	Environmental Geology	5
EART 20L	Environmental Geology Laboratory	1

Five lower-division science courses (plus laboratories) chosen from the following:

Where the lab course follows a lecture course the pair of courses counts as a single course.

BIOL 20A	Cell and Molecular Biology	5
BIOE 20B	Development and Physiology	5
BIOE 20C	Ecology and Evolution	5
CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1M	General Chemistry Laboratory	2
CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 6B	Introductory Physics II	5
PHYS 6M	Introductory Physics II Laboratory	1

Getting Started at UCSC as a Transfer Student

Whether you are planning for your future transfer or are already admitted to UC Santa Cruz, we aim to provide our transfer students the information and support needed to successfully complete a science degree at UC Santa Cruz.

Once you have submitted your intent to register at UC Santa Cruz, here is a step-by-step guide to transferring your coursework and getting enrolled:

1. Confirm you are a proposed Earth sciences/anthropology major.

If you are not sure of your status, log on to your MyUCSC portal to view your proposed major. If your major is proposed Earth sciences/anthropology you are all set. If the proposed major listed is not Earth

sciences/anthropology, you will need to meet with the advisor for Earth sciences.

2. Once your courses have been articulated, you will receive an email from our office.

This email will include information on how your coursework articulated, suggestions for fall enrollment, and invite you to make an appointment to talk with your major advisor.

3. Make an appointment to talk to an advisor.

Your confirmation email will include instructions for scheduling an advising appointment. Appointments are available either by phone or in person.

4. Participate in Transfer Orientation and Welcome Week.

Transfer orientation provides instructions on how to transfer your coursework to UC Santa Cruz, the advising and support available, and how to enroll. Our online transfer orientation provides all the critical information you need to transition to UC Santa Cruz and begin your major coursework.

The department also hosts a transfer student welcome in the fall that provides new transfer students an opportunity to meet other transfer students, familiarize themselves with the campus and the available resources. Welcome Week includes presentations on the Earth sciences majors, including an overview of the field courses offered and an introduction on how to get involved in undergraduate research.

5. Declaring the Earth Sciences/Anthropology combined major.

In order to declare the Earth sciences/anthropology combined major transfer students must complete EART 5, or EART 10 or EART 20 or an approved equivalent course (with a C or better) and meet with the Earth and Planetary Sciences Department advisor by the declaration deadline.

Welcome, we look forward to meeting you!

Letter Grade Policy

This program, Earth sciences/anthropology, does not have a letter grade policy. Students must adhere to the campus letter grade policy.

[Optional Catchall]**Course Substitution Policy**

Relevant courses taken at UC Santa Cruz or other institutions may be substituted for degree requirements by approved petition. Please see the undergraduate advisor for the substitution petition form and more information about this process.

Double Majors and Major/Minor Combinations

Policy**Study Abroad****Honors**

Honors in the major (all concentrations) and in the combined major with anthropology are determined by a review of grades (typically 3.50 or above) at the time a student applies for graduation. A faculty committee makes the decision based on the quality of all coursework, but especially in the courses required for the major. Extra coursework or independent study as well as more intensive or rigorous coursework and the quality of a capstone project may also be taken into consideration. Highest honors may also be awarded in exceptional cases when a student's overall grade point average (GPA) is above 3.75 and performance in the senior capstone requirement is equally outstanding. The department reserves the right to withhold honors and highest honors based on other criteria, such as an incident of academic dishonesty.

Honors on the senior thesis are determined independently of major honors, and must be approved by two faculty readers.

Keys to Success in the Major**[Optional Catchall]****Requirements and Planners****Course Requirements****Lower-Division Courses****All of the following courses:**

ANTH 1	Introduction to Biological Anthropology	5
ANTH 2	Introduction to Cultural Anthropology	5
ANTH 3	Introduction to Archaeology	5

Plus one of the following options:

Either these courses		
EART 5	California Geology	5
EART 5L	California Geology Laboratory	1
or these courses		
EART 10	Geologic Principles	5
EART 10L	Geologic Principles Laboratory	1
or these courses		
EART 20	Environmental Geology	5
EART 20L	Environmental Geology Laboratory	1

Plus one of the following options:

MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5
OR		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

Five lower-division science courses (plus laboratories) chosen from the following:

Where the lab course follows a lecture course the pair of courses counts as a single course.

BIOL 20A	Cell and Molecular Biology	5
BIOE 20B	Development and Physiology	5
BIOE 20C	Ecology and Evolution	5
CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1M	General Chemistry Laboratory	2
CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 6B	Introductory Physics II	5
PHYS 6M	Introductory Physics II Laboratory	1

Upper-Division Courses

EART 110A	Evolution of the Earth	5
EART 110L	Evolution of the Earth Laboratory	2

Electives

At least three upper-division elective courses from upper-division Earth sciences offerings must be completed. EART 198 may not be used to satisfy this requirement.

Any four upper-division elective courses between five and seven units listed under the Anthropology Department's biological, medical, environmental anthropology and archeology course subdivisions (see program statement for the anthropology B.A.).

Disciplinary Communication (DC) Requirement

At least two courses that are part of the DC requirement must be completed as part of the required upper-division courses.

Earth Sciences courses that are part of the DC curriculum are:

EART 100	Vertebrate Paleontology	5
EART 101	Invertebrate Paleobiology	5

EART 102	Marine Geology	5
EART 104	Geologic Hazards	5
EART 109	Elements of Field Geology	5
EART 120	Sedimentology and Stratigraphy	5
EART 140	Geomorphology	5
EART 146	Groundwater	5
EART 148	Glaciology	5
EART 150	Structural Geology	5
EART 160	Planetary Science	5
EART 189B	Summer Field Study	5
EART 191A	Climate Change Science and Policy	5
EART 195	Senior Thesis	5
EART 191C	Practical Geophysics	5

EART 189B formerly EART 188B

Anthropology courses that are part of the DC curriculum are:

ANTH 100	History and Theory of Biological Anthropology	5
ANTH 170	History of Archaeological Theory	5
ANTH 194B	Chimpanzees: Biology, Behavior, and Evolution	5
ANTH 194L	Archaeology of the African Diaspora	5
ANTH 194Y	Archaeologies of Space and Landscape	5

Comprehensive Requirement

One of the following:

Satisfactory completion of Anthropology 194-series (any senior seminar in physical anthropology or archaeology).

Satisfactory completion of EART 189A and EART 189B*, Geographic Information Systems with Applications in Earth sciences and Summer Field Internship.

Satisfactory completion of a senior thesis (EART 195) with faculty readers from both departments, which must include a significant element of independent research or original work and can only be undertaken after agreement is obtained from faculty members to supervise it (at least three quarters in advance of completion).

Satisfactory completion of a 5-credit internship (EART 198) under the guidance of an on-site supervisor, with coordination and prior approval of the Earth and Planetary Science Department's internship director. The project must include a comprehensive final written report.

* EART 189A and EART 189B have as prerequisites EART 109 and EART 109L, EART 110A and EART 110L, and EART 110B and EART 110M.

Note: Courses used to satisfy the senior comprehensive requirement **cannot** also be used to fulfill the upper-division elective requirement.

Planners

Sample Four-Year Planner

Year	Fall	Winter	Spring
1st (frosh)	ANTH 1	ANTH 2	ANTH 3 EART 10 & EART 10L
2nd (soph)	MATH 11A or MATH 19A	MATH 11B or MATH 19B	CHEM, PHYS or BIO
	ANTH elective	CHEM, PHYS or BIO	CHEM, PHYS or BIO
3rd (junior)	EART 110A & EART 110L	EART elective	ANTH elective
	CHEM, PHYS or BIO	CHEM, PHYS or BIO	EART elective
4th (senior)	ANTH elective Sr comp	EART elective Sr comp	ANTH elective Sr comp

In addition to the specific courses shown in these planners, a student must complete courses satisfying the CC, ER, IM, SR, and TA general education requirements.

Sample Two-Year Planner

This planner assumes that students have completed all lower-division requirements except ANTH 1 and EART 5 and EART 5L, or EART 10 and EART 10L, or EART 20 and EART 20L.

Year	Fall	Winter	Spring
1st (junior)	ANTH 1	EART elective	EART elective
	EART 5 & EART 5L	ANTH elective	ANTH elective
2nd (senior)	ANTH elective	ANTH elective	ANTH 194+ or ANTH 196+ or EART 189A*

or sr
thesis
(EART
195)†

EART 110A & EART 110L*	EART elective
(Sr thesis only) EART 199†	(Sr thesis only) EART 199†

*Students who wish to complete their capstone with EART 189A and EART 189B should be aware that the following courses are prerequisites: EART 109 & EART 109L, EART 110A & EART 110L, and EART 110B & EART 110M. Students must also complete EART 189B in summer to fulfill the summer field capstone.

†Satisfactory completion of ANTH 194 or ANTH 196-series (any senior seminar in physical anthropology or archaeology) fulfills the capstone.

†Students expecting to write a senior thesis for their comprehensive requirement are required to contact the department at least three quarters before graduation to identify the intended project and faculty advisor. Senior theses usually require at least two or three quarters for completion.

EARTH SCIENCES MINOR

Course Requirements

Students can earn a minor in Earth sciences by taking the following courses:

Lower-Division Courses

Choose one of the following options:

Either these
courses

EART 5	California Geology	5
EART 5L	California Geology Laboratory	1

or these
courses

EART 10	Geologic Principles	5
EART 10L	Geologic Principles Laboratory	1

or these
courses

EART 20	Environmental Geology	5
EART 20L	Environmental Geology Laboratory	1

Upper-Division Courses

Five upper-division Earth or ocean sciences courses.

Courses offering fewer than 5 credits (such as EART 190 or 2-credit laboratories and independent studies) may not

be counted toward the minor requirements, although additional coursework is always encouraged.

NOTE: Lecture and lab combinations count as a single course

EARTH AND PLANETARY SCIENCES CONTIGUOUS BACHELORS MASTERS PATHWAY

Introduction

The Earth and Planetary Sciences contiguous five-year Bachelor's/Master's program allows motivated students to complete a B.S. in Earth sciences or environmental sciences, and then an M.S. in Earth sciences in five years with appropriate planning. The program is designed for promising students who have demonstrated aptitude for fundamental course work in the classroom, as well as the capacity, interest, and motivation to conduct independent research through collaborations with a faculty mentor.

Eligibility Requirements

Students enrolled in the Earth sciences B.S. or Environmental sciences B.S. programs who will complete their undergraduate degree within normative time (four years for students who enter the B.S. program as frosh, three years for sophomore transfer students, or two years for junior transfer students) are eligible for the contiguous Bachelor's/Master's program. Interested students from other majors may petition the department for admission to the pathway, provided that they have been participating in research with faculty in Earth and Planetary Sciences and have a coursework foundation that will enable success in the graduate curriculum. A GPA in the major of 3.0 or higher is required, as well as demonstrated research progress and a strong endorsement from a sponsoring faculty advisor. Students must complete their undergraduate degree requirements by the end of the summer quarter prior to enrolling in the M.S. program in the fall.

Application Process

Interested students should attend an information session during their junior year and complete an associated survey to declare their interest in the Bachelor's/Master's program. During the fall quarter of their senior year, students must formally apply to the master's program during the normal admissions cycle and through the standard graduate application process. The application deadline is typically in early January.

Program Requirements

Students in the Bachelor's/Master's program must take a minimum of 35 credits total of graduate and upper-division undergraduate courses, of which no more than 15 credits may be upper-division undergraduate courses. Of the required graduate-level courses, a minimum of 20 credits must be courses other than supervised research (EART 297) except by special exception of the Graduate Council. All Bachelor's/Master's program students will take the required graduate core series of EART 203, Introductory Teaching Seminar, EART 204, Earth And Planetary Sciences Foundations, and EART 206, Great Papers in the Earth Sciences.

Students in the program must also take one graduate-level "analytical" course and one graduate-level "subject" course. The classes that fulfill these requirements are listed in the EPS Graduate Student Handbook and in the course lists below. Analytical and subject classes may be taken in the senior year; the credits will count toward 180 undergraduate credits and the course can count toward the B.S. degree upper-division elective requirement, but the analytical or subject content will fulfill the M.S. program requirement. However, class credits cannot be double counted in both B.S. and M.S. degrees, so students are still required to complete 35 credits (no more than 15 of which may be upper-division undergraduate) during their M.S. career. In addition, EART 195 cannot count toward the M.S. degree and students cannot earn credit for a graduate course when they have previously taken the cross-listed undergraduate version. In order to fulfill the capstone requirement for the M.S. degree, students must also complete a master's thesis (Plan I).

Subject Courses

EART 207	Tectonics	5
EART 208	Methods in Paleoclimatology	5
EART 220	Ground Water Modeling	5
EART 254	The Climate System	5
EART 258	Deep Time Paleoclimates	5
EART 262	Planetary Interiors	5
EART 263	Planetary Surfaces	5
EART 264	Planetary Atmospheres	5
EART 270	Global Seismology	5
EART 272	Geophysical Fluid Dynamics	5
AM 275	Magnetohydrodynamics	5
OCEA 213	Biogeochemical Cycles	5

EART 208 currently not offered.

Analytical Courses

EART 225	Statistics and Data Analysis in the Geosciences	5
EART 229	Isotopic Methods in Environmental Science	5
EART 265	Order of Magnitude Estimation	5
EART 266	Geologic Signal Processing and Inverse Theory	5

AM 100	Mathematical Methods for Engineers	5
AM 147	Computational Methods and Applications	5
AM 211	Foundations of Applied Mathematics	5
AM 215	Stochastic Modeling in Biology	5
ASTR 260	Instrumentation for Astronomy	5
CHEM 122	Principles of Instrumental Analysis	5
BIOE 286	Experimental Design and Data Analysis	5
ENVS 215A	Geographic Information Systems and Environmental Applications	5
ENVS 215L	Exercises in Geographic Information Systems	2
MATH 106	Systems of Ordinary Differential Equations	5
MATH 107	Partial Differential Equations	5
OCEA 215	Predicting the Atmosphere, Ocean, and Climate	5
OCEA 260	Introductory Data Analysis in the Ocean and Earth Sciences	5
PHYS 116A	Mathematical Methods in Physics	5
PHYS 116B	Mathematical Methods in Physics	5
PHYS 116C	Mathematical Methods in Physics	5
PHYS 160	Practical Electronics	5
PHYS 242	Computational Physics	5
STAT 132	Classical and Bayesian Inference	5
STAT 206	Applied Bayesian Statistics	5
STAT 226	Spatial Statistics	5

Planners

Below are 5- and 3-year planners for students in the Bachelor's/Master's program who enter UC Santa Cruz as frosh and as junior transfer students.

Five-Year Planner for Students Entering the Earth Sciences B.S. as Frosh

Year	Fall	Winter	Spring
1st (frosh)	CHEM 1A	MATH 11A or MATH 19A	MATH 11B or MATH 19B
	EART 5 & EART 5L	CHEM 1B & CHEM 1M	CHEM 1C & CHEM 1N

2nd (soph)	EART 110A & EART 110L*	EART 110B & EART 110M*	PHYS 6B & PHYS 6M
	PHYS 6A & PHYS 6L	Advanced math/coding	EART 110C & EART 110N
3rd (junior)	EART elective	EART elective	EART elective
			EART elective
4th (senior)	EART 199†	EART 199†	EART 195† and/or
	EART elective	EART elective	EART 189A*
5th (master's)	EART 203	EART 206	
	EART 204	Subject or Analytical Class††	Subject or Analytical Class††
	EART 297	EART 297	EART 297

*Students who wish to complete their capstone with EART 189A and EART 189B should be aware that the following courses are prerequisites: EART 109 and EART 109L, EART 110A and EART 110L, and EART 110B and EART 110M. Students must also complete EART 189B in summer to fulfill the summer field capstone. In addition to the specific courses shown in these planners, a student must complete courses satisfying the CC, ER, IM, SR, and TA general education requirements.

†Students expecting to write a senior thesis for their comprehensive requirement are required to contact the department at least three quarters before graduation to identify the intended project and faculty adviser. Senior theses usually require at least two or three quarters for completion.

†† In consultation with their research advisor and faculty graduate representative, the student will select at least one “subject” course focusing on specific Earth and planetary sciences content and one “analytical” course that builds

quantitative analytical skills (from a list in the EPS Graduate Handbook) and also included above.

Three-Year Planner for Students Entering the Earth Sciences B.S. as Junior Transfers

This planner assumes that students have completed all lower-division requirements, other than PHYS 6A and PHYS 6L, PHYS 6B and PHYS 6M, and advanced math/coding.

Year	Fall	Winter	Spring
1st (junior)	Advanced math/coding	PHYS 6A & PHYS 6L	PHYS 6B & PHYS 6M
	EART 110A & EART 110L	EART 110B & EART 110M	EART 110C & EART 110N
2nd (senior)	EART elective	EART elective	EART elective
	EART elective	EART elective	EART 189A* and/or
	EART 199†	EART 199†	EART 195†
3rd (master's)		EART 206	
	EART 203	Subject or Analytical Class††	Subject or Analytical Class††
	EART 204	EART 297	EART 297

*Students who wish to complete their capstone with EART 189A and EART 189B should be aware that the following courses are prerequisites: EART 109 and EART 109L, EART 110A and EART 110L, and EART 110B and EART 110M. Students must also complete EART 189B in summer to fulfill the summer field capstone.

†Students expecting to write a senior thesis for their comprehensive requirement are required to contact the department at least three quarters before graduation to identify the intended project and faculty adviser. Senior theses usually require at least two or three quarters for completion.

†† In consultation with their research advisor and faculty graduate representative, the student will select at least one “subject” course focusing on specific Earth and planetary

sciences content and one “analytical” course that builds quantitative analytical skills (from a list in the EPS Graduate Handbook) and also included above.

EARTH SCIENCES M.S.

Introduction

The graduate program in the Earth and Planetary Sciences Department is designed to prepare students for research, industry, consulting, teaching, and numerous other career paths, including business and law. The aim is to develop habits of critical analysis and thorough documentation; skills in quantitative field, computational, and/or laboratory research; and proficiency in one or more fields of research. The fundamental requirements for admission to the program are substantial evidence of superior scholarship, dedication and determination to do quality work, and aptitude for original research. Preparation in the basic sciences equivalent to the requirements for the Earth sciences bachelor's degree at UC Santa Cruz is expected and, for non-undergraduate Earth sciences majors, achieving breadth of knowledge across the Earth and planetary sciences is expected. Excellent scholars from other disciplines, including chemistry, physics, engineering, biology, or astronomy are both eligible and encouraged to apply. Gaps in knowledge can be made up through coursework.

UC Santa Cruz awards both the Master of Science (M.S.) and the Doctor of Philosophy (Ph.D.) degrees. The M.S. degree may be the terminal degree for someone seeking careers in industry, government, and teaching at the secondary level. It may also be an initial step toward the Ph.D. degree, in which the student gains knowledge and confidence in carrying out and completing a more complex scientific project. Details regarding admission to graduate standing, financial aid, examinations, and the requirements for the Master of Science and Doctor of Philosophy degrees are available from the Earth and Planetary Sciences Department graduate studies webpage. Additional details can be found at the UC Santa Cruz Division of Graduate Studies.

Requirements

Course Requirements

Plan 1 Thesis M.S. Track.

Prior to the first quarter of study, each first-year thesis track student must meet with their faculty advisor to determine a customized study plan designed to improve breadth and enable research goals. Immediately afterwards, a meeting is scheduled with the faculty graduate representative to finalize and approve this initial discussion with a written course plan. Yearly academic review meetings with the primary advisor will then reassess the student's progress in completing these courses and independent research.

In their first year, all thesis-track graduate

students register for:

EART 203	Introductory Teaching Seminar	1
EART 204	Earth and Planetary Sciences Foundations	5
EART 206	Great Papers in the Earth Sciences	5

In subsequent years, all students participate in:

EART 293	Graduate Research Seminar	1
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Plan 2 Coursework M.S. Track.

The coursework M.S. track is a professional program designed to allow students to increase their breadth, quantitative depth, or emphasis on a particular specialty; to provide the student with a stronger background toward competition for jobs or an enhancement of skills for current employment (e.g., K–14 teaching); and to allow students from other disciplines (e.g., biology, physics, chemistry, mathematics, environmental studies) to acquire advanced training in Earth and planetary sciences. Prior to the first quarter of study, students meet with their faculty advisor to develop a study plan of at least nine 5-credit courses, and a statement of objectives. Of these courses, only one can be from the EART 280-EART 290 series, and at least 20 credits must come from graduate courses numbered EART 200-EART 279. One of the nine courses can be an independent study involving a focused research project. It is expected that the course plan will comprise a minimum of 45 quarter credits at the graduate-level and quantitative, upper-division, undergraduate-level elective courses. The course plan must be approved by the graduate representative. Degree completion in one year would be emphasized.

Coursework M.S. students are required to fulfill one of the following capstone options: a substantial review/research manuscript or a comprehensive oral examination based on their coursework.

Pre-Qualifying Requirements

Admission to the Coursework M.S. Track would require willing and explicit sponsorship by an EPS faculty member.

Foreign Language Requirements

There is no foreign-language requirement other than demonstrated proficiency in English. Applicants from countries where English is not the primary language must take either the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) test.

Teaching Experience

It is recommended that all thesis-track graduate students attain some teaching experience while at UC Santa Cruz.

Other Requirements

Applying for Graduation

EARTH SCIENCES PH.D.

Introduction

The graduate program in the Earth and Planetary Sciences Department is designed to prepare students for research, industry, consulting, teaching, and numerous other career paths, including business and law. The aim is to develop habits of critical analysis and thorough documentation; skills in quantitative field, computational, and/or laboratory research; and proficiency in one or more fields of research. The fundamental requirements for admission to the program are substantial evidence of superior scholarship, dedication and determination to do quality work, and aptitude for original research. Preparation in the basic sciences equivalent to the requirements for the Earth sciences bachelor's degree at UC Santa Cruz is expected and, for non-undergraduate Earth sciences majors, achieving breadth of knowledge across the Earth and planetary sciences is expected. Excellent scholars from other disciplines, including chemistry, physics, engineering, biology, or astronomy are both eligible and encouraged to apply. Gaps in knowledge can be made up through coursework.

UC Santa Cruz awards both the Master of Science (M.S.) and the Doctor of Philosophy (Ph.D.) degrees. The M.S. degree may be the terminal degree for someone seeking careers in industry, government, and teaching at the secondary level. It may also be an initial step toward the Ph.D. degree, in which the student gains knowledge and confidence in carrying out and completing a more complex scientific project. Details regarding admission to graduate standing, financial aid, examinations, and the requirements for the Master of Science and Doctor of Philosophy degrees are available from the Earth and Planetary Sciences Department graduate studies webpage. Additional details can be found at the UC Santa Cruz Division of Graduate Studies.

Advancement to Candidacy

Course Requirements

Thesis Ph.D. Track

In their first year, all thesis-track graduate students register for:

EART 203	Introductory Teaching Seminar	1
EART 204	Earth and Planetary Sciences Foundations	5
EART 206	Great Papers in the Earth Sciences	5

In subsequent years, all students participate in:

EART 293	Graduate Research Seminar	1
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Foreign Language Requirements

There is no foreign-language requirement other than demonstrated proficiency in English. Applicants from countries where English is not the primary language must take either the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) test.

Teaching Requirement

It is recommended that all thesis-track graduate students attain some teaching experience while at UC Santa Cruz.

Pre-Qualifying Requirements

Qualifying Examination

To qualify for candidacy in the Ph.D. program, each student must pass an oral examination in their area of specialization by the end of their third year of graduate study (second year if entering with a master's degree in the same field), although students are strongly encouraged to take the examination earlier. The examination is based on a written research proposal presenting one or more specific questions to be researched by the student in the course of completing their Ph.D. thesis. Students are expected to have in-depth knowledge of fields relevant to the proposal, including familiarity with the professional literature.

Post-Qualifying Requirements

[Optional Catchall]

Dissertation

Dissertation

The Ph.D. dissertation is a scholarly contribution to knowledge that embodies the results of original and creative effort by the student. Students are urged to prepare their dissertations for publication in peer-reviewed professional journals.

Dissertation Defense

A public oral defense of the thesis is required prior to completion of the Ph.D. degree.

Academic Progress

Prior to the first quarter of study, each first-year thesis track student must meet with their faculty advisor to determine a customized study plan designed to improve breadth and enable research goals. Immediately afterwards, a meeting is scheduled with the faculty graduate representative to finalize and approve this initial discussion with a written course plan. Yearly academic review meetings will then reassess the student's progress in completing these courses and independent research, initially with the primary advisor but eventually with a reading committee.

Applying for Graduation

Ecology and Evolutionary Biology

130 McAllister Way
Coastal Science Campus
<https://www.eeb.ucsc.edu>

PROGRAMS OFFERED

Biology B.A. (p. 297)

Ecology and Evolution B.S. (p. 302)

Marine Biology B.S. (p. 310)

Plant Sciences B.S. (p. 317)

Ecology and Evolutionary Biology Bachelor's/Master's
Contiguous Pathway (p. 324)

Ecology and Evolutionary Biology M.A. (p. 326)

Ecology and Evolutionary Biology Ph.D. (p. 327)

Ecology and Evolutionary Biology Designated Emphasis
(p. 328)

OTHER PROGRAMS OF INTEREST

Science Education B.S. (p. 398)

Environmental Studies/Biology Combined Major B.A. (p. 642)

UNDERGRADUATE PROGRAM

The Department of Ecology and Evolutionary Biology (EEB) is devoted to the study of ecological and evolutionary processes across marine, terrestrial, and freshwater environments. Our approach is to blend an emphasis on key ideas and concepts with a focus on organismal biology and natural history. Recent advances in both analytical and genetic methods have given us a far richer understanding of the complexities of ecological and evolutionary processes in the natural world, allowing us to tackle ever more sophisticated questions. Biologists at UC Santa Cruz have played and will continue to play an important part in these advances, and the campus programs offer unique educational opportunities in biology that feature small class sizes, field studies, and extensive faculty-student interactions.

Class offerings and student research opportunities leverage the varied natural environments in the Monterey Bay region, throughout the western US, and in more distant locations such as Africa, Europe, Mexico, Tahiti, Australia, and East Asia. This emphasis on field and laboratory studies is the hallmark of our undergraduate majors. Within this context they address not only basic ecological and evolutionary processes, but also the application of this knowledge to advance environmental, conservation and sustainability science.

An outstanding group of faculty, each with a vigorous, internationally recognized research program, is available to teach courses in their specialties as well as core courses for the major. Areas of research strength within the department include plant biology, animal behavior, physiology, evolution, ecology, and marine biology. UC Santa Cruz is unique in the UC system in providing exceptional opportunities for undergraduate research, allowing students to interact one-on-one with faculty and other researchers in a laboratory or field setting.

Students may plan a program that leads to one of several bachelor of arts (B.A.) and bachelor of science (B.S.) degrees. These different majors overlap considerably in content and differ mainly in providing students with flexibility to take a few more courses that focus on the major subject. Students may choose from the following major options:

Biology B.A.

Ecology and Evolution B.S.

Marine Biology B.S.

Plant Sciences B.S.

Environmental Studies/Biology combined major B.A. (administered by the Environmental Studies Department).

EEB offers a variety of independent research opportunities for students. Advanced undergraduates, with the guidance of faculty mentors, have access to extensive departmental laboratories, including state-of-the-art genetics, physiology, and marine science facilities, for independent research. Fieldwork draws on a remarkable variety of terrestrial, marine, and freshwater ecosystems, all in close proximity to campus. Terrestrial studies are supported by the UC Santa Cruz reserve on campus, an arboretum, greenhouse facility, and vehicles to transport students to field sites off campus. Freshwater studies have access to a number of coastal tributaries and laboratory facilities at the Coastal Biology Building. Marine studies are supported on the Coastal Science Campus with running seawater facilities, a boating program, and an AAUS accredited SCUBA diving program for underwater classes and research. Año Nuevo Island, north of Santa Cruz, is the site of extensive behavioral studies of marine mammals. The Norris Center, located in the Environmental Studies Department on the main campus, provides a natural history hub for the entire campus and offers opportunities for students to learn about natural history and museum techniques. In addition to coursework, there is an array of opportunities for directed independent study that enables majors to enhance their upper-division programs to reflect and strengthen their own interests and goals in the sciences.

Descriptions of faculty research interests and nearby coastal and marine environments, institutions, and facilities are available through the Ecology and Evolutionary Biology (EEB) Department website.

GRADUATE PROGRAM

The ecology and evolutionary biology (EEB) graduate program at UC Santa Cruz reflects the remarkable local and global diversity of species and environments studied by the EEB faculty and students. The vision of the EEB graduate program is to provide a nurturing, creative, and intellectual environment conducive to the development of world-class scientists. The EEB graduate program encourages close working relations between students and faculty in an informal atmosphere advantageous to rapid learning and professional growth. Interdisciplinary collaborations with oceanographers, geologists, mathematicians, environmental and conservation biologists, toxicologists, and others enable students to explore the conceptual connections between related fields as they acquire mastery in their areas of specialization.

The graduate program in EEB at UC Santa Cruz is one of the premier EEB programs in the country. UCSC graduate students in EEB regularly win prestigious research fellowships and awards for their presentations at international meetings in addition to publishing their work in the best journals of their fields. Students take advantage of local field sites and state-of-the-art departmental laboratories, more than two-thirds of the EEB faculty also participate in field studies throughout the world, especially in Africa, Latin America, Antarctica, the Arctic, and around the Pacific Rim. Research in EEB comprises four core areas: ecology, evolutionary biology, physiology, and behavior.

BIOLOGY B.A.

Information and Policies

Introduction

The general biology bachelor of arts major permits flexibility, but demands careful attention to a student's own interests and plans. Each student should select courses on the basis of up-to-date information in consultation with an Ecology and Evolutionary Biology (EEB) Department advisor or faculty advisor whose interests reflect the student's interests. A hallmark of the major is the many field courses that introduce students to a diversity of ecosystems and the skills to conduct field research. See the Ecology and Evolutionary Biology undergraduate webpage for more information on these courses.

Academic Advising for the Program

Academic advising is available at the Department of Ecology and Evolutionary Biology (EEB) undergraduate advising office located in the Coastal Biology Building on the UC Santa Cruz Coastal Science Campus, and via email at eebadvising@ucsc.edu. The undergraduate webpages contain advice and information pertinent to students' most frequently voiced questions. Each student should review the information posted on the website; for further assistance, contact an EEB undergraduate advisor

at eebadvising@ucsc.edu. Transfer students should also review the Transfer Information and Policy Section.

Getting Started in the Major

Prerequisites

The introductory biology sequence is prerequisite to virtually all upper-division biology courses. BIOL 20A (offered by the Molecular, Cell, and Developmental Biology Department) has a prerequisite of CHEM 1A. Therefore, it is essential for students to start chemistry as soon as possible. Students who have not taken CHEM 1A may begin the introductory sequence with BIOE 20C. The entire introductory biology sequence should be taken the first and second year, concurrently with or following the general chemistry sequence. We also strongly recommend completing the lower-division physics requirements early in your academic career.

An online mathematics placement is required to enroll in a mathematics course. Students are expected to take this examination and are encouraged to work in the learning modules until they place into calculus. For more information see the mathematics placement website.

Advanced placement (AP) course equivalencies can be used to fulfill prerequisites.

Program Learning Outcomes

The undergraduate curriculum offered by the Department of Ecology and Evolutionary Biology (EEB) is designed to ensure that all students declared in any EEB sponsored major will achieve the following seven program learning outcomes.

1. Students will demonstrate broad-based knowledge of the fundamentals of ecology, behavior, evolution and physiology and the relationships among these disciplines.
2. Students will demonstrate skills in the observation and experimental study of organisms, using both field-based and laboratory-based approaches.
3. Students will demonstrate skills in identifying, accessing, comprehending and synthesizing scientific information, including interpretation of the primary scientific literature. This includes understanding key questions and hypotheses, interpreting results and conclusions, and evaluating quality through critique.
4. Students will demonstrate the ability to conceive and execute independent scientific research, including developing their own questions and hypotheses, designing an appropriate theoretical or empirical/experimental approach, executing that approach, and analyzing and interpreting data.
5. Students will demonstrate an ability to understand and apply fundamental quantitative skills, including models and statistical analyses, so as to

properly interpret published research and apply such skills in their own research.

- Students will demonstrate the ability to communicate scientific work, such as a scientific paper, proposal, essay, or notebook, in written, oral or poster format.
- Students will exhibit strong teamwork and problem-solving skills. They will demonstrate the ability to make arguments from evidence and work together to find optimal solutions.

Major Qualification Policy and Declaration Process

Major Qualification

All courses must be taken for a letter grade. The following qualification courses, or their equivalents, must be completed with a grade of C (2.0) or better:

All of the following courses:

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
BIOL 20A	Cell and Molecular Biology	5
BIOE 20B	Development and Physiology	5
BIOE 20C	Ecology and Evolution	5

Appeal Process

Students who are not eligible to declare the major may appeal this decision after they have successfully completed the qualification courses by submitting an appeal letter to EEB undergraduate advising. Within 15 business days of receipt of the appeal, the department will notify the student and college of the decision. For more information about the appeal process, see the appeal process website.

How to Declare a Major

Students may submit a petition to declare after successful completion of the qualification policy courses. Students submit their major declaration petition on the EEB website here. Students proposed in the major should submit a major declaration petition in the quarter of their major declaration deadline (i.e., sixth quarter for students admitted as frosh). The department will declare the student's major, deny the student admission to the major, or set conditions for admission (provided the conditions may be met within no more than one quarter of enrollment) based on the student's qualification to declare at the time the major declaration petition is received. Information on major declaration can be found here. Additional questions may be directed to eebadvising@ucsc.edu.

Transfer Information and Policy

Transfer Admission Screening Policy

The following courses or their equivalents are required prior to transfer, by the end of the spring term for students planning to enter in the fall.

BIOL 20A	Cell and Molecular Biology	5
BIOE 20B	Development and Physiology	5
BIOE 20C	Ecology and Evolution	5
CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5

A minimum GPA of 2.0 must be obtained in the courses listed above.

Getting Started at UCSC as a Transfer Student

Transfer students who satisfy the major screening requirements may declare the major at any time after matriculation only after their official transcripts have been posted to their MyUCSC student portal by the UCSC Office of Admissions.

Beginning in late June and early July (for fall transfer students) EEB Advising will review admitted students' reported transfer course work and determine how it applies to their major's requirements. EEB Advising will contact admitted students via email. The email will include information on how students' transfer coursework fulfills major requirements. We will suggest courses for students' fall enrollment, and invite you to make an appointment to talk with EEB Undergraduate Advising or direct questions to eebadvising@ucsc.edu. Transfer students may also expect to receive regular email messages from EEB Advising in June, July, and August with additional information about the major.

Letter Grade Policy

All courses used to satisfy any major requirement must be taken for a letter grade.

[Optional Catchall]

Course Substitution Policy

To discuss the process for a course substitution, contact an EEB undergraduate advisor.

At least half of the upper-division courses (numbered BIOE 100–BIOE 179) required for each major must be taken in EEB at UC Santa Cruz not as transfer credits from another department or institution.

Transfer students are advised to contact an EEB undergraduate advisor before enrolling in numerous upper-division courses at other institutions. For more information on transferring courses to UC Santa Cruz, please consult the Transfer Coursework website. Additional information for transfer students is provided above in the "Transfer Students" section.

Only one upper-division course requirement may be met with a research-based independent study or graduate-level UC Santa Cruz biology course.

Double Majors and Major/Minor Combinations Policy

Students interested in pursuing multiple majors within the biological sciences may not declare any combination of Biology (B.A., B.S., or minor), Ecology and Evolution B.S., Marine Biology B.S., Plant Sciences B.S., or Environmental Studies/Biology B.A. combined major.

Study Abroad

The UC Education Abroad Program (UCEAP) offers qualified students unique opportunities to broaden their educational horizons. The EEB Department encourages interested students to participate. It is possible to satisfy major requirements abroad and graduate on time; consult with an EEB undergraduate advisor early in the planning process.

Many programs are in English-speaking countries or use English for advanced courses. Many programs offer small classes, extensive laboratories, and/or field research experience.

There are excellent programs in Costa Rica, Australia, New Zealand, the United Kingdom, Denmark, and Germany, among others. The Costa Rica Tropical Biology Program is of note to students interested in tropical biology and ecology. Held spring and fall quarters at the Monteverde research station, this program gives students experience with hands-on field research and offers a homestay program. The University of Queensland (Australia) offers an intensive, full-semester marine science program, which includes stays at research stations on the Great Barrier Reef and in sheltered mangrove and seagrass habitats near Brisbane.

Students interested in study abroad need to get an early start on their introductory requirements, including chemistry, mathematics, and biology and must declare their major prior to going abroad. Visit the UCEAP office as soon as possible to begin planning and seek advice and approval for your UCEAP plan from an EEB undergraduate advisor prior to participation in UCEAP.

Honors

Honors in the biological sciences majors are awarded to graduating students whose academic performance demonstrates excellence at a grade point average (GPA) of 3.5 or above. Highest honors are awarded to those students whose performance demonstrates the highest level of excellence and results in a GPA of 3.8 or above.

[Optional Catchall]

Requirements and Planners

Course Requirements

Lower-Division Courses

Introductory Biology:

BIOL 20A	Cell and Molecular Biology	5
BIOE 20B	Development and Physiology	5
BIOE 20C	Ecology and Evolution	5

General Chemistry:

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5

Statistics:

Choose one of the following options:

Either this course		
STAT 5	Statistics	5
or these courses		
STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

Physics:

Choose one of the following courses. Enrollment in PHYS 6A or PHYS 7A requires concurrent enrollment in the PHYS 6L laboratory:

PHYS 1	Physics for Everyone	5
PHYS 6A	Introductory Physics I	5
PHYS 7A	Elementary Physics I	5

Upper-Division Courses

A total of eight upper-division biology courses, including electives, as follows:

Three core courses:

BIOL 105	Genetics	5
BIOE 107	Ecology	5
BIOE 109	Evolution	5

One of the following anatomy or physiology courses:

BIOE 131	Animal Physiology	5
BIOE 131L	Animal Physiology Laboratory	2
BIOE 133	Exercise Physiology	5
BIOE 133L	Exercise Physiology Laboratory	2
BIOE 134	Comparative Vertebrate Anatomy	5
BIOE 134L	Comparative Vertebrate Anatomy Laboratory	2
BIOE 135	Plant Physiology	5

BIOE 135L	Plant Physiology Laboratory	2
BIOE 136	Environmental Physiology	5
BIOL 130	Human Physiology	5
BIOL 130L	Human Physiology Laboratory	2
METX 135	Functional Anatomy	5
METX 135L	Functional Anatomy Lab	2

Note: Lecture/lab combinations count as a single course.

BIOE 131 & BIOE 131L, BIOL 130 & BIOL 130L:
Laboratory optional

Electives

Four additional electives chosen from BIOE courses numbered 100-179 or the following BIOL courses:

BIOL 100	Biochemistry	5
BIOL 101	Molecular Biology	5
BIOL 110	Cell Biology	5
BIOL 111	Immunology	5
BIOL 115	Eukaryotic Molecular Biology	5
BIOL 120	Developmental Biology	5
BIOL 125	Introduction to Neuroscience	5
METX 100	Introduction to Microbiology	5
METX 119	Microbiology	5
METX 119L	Microbiology Laboratory	5

Note: Lecture/lab combinations count as a single course.

Some of these electives may have prerequisites that do not satisfy major or minor requirements.

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division disciplinary communication (DC) requirement. The DC requirement for the biology bachelor of arts degree is satisfied by completing two of the following Ecology and Evolutionary Biology courses:

BIOE 108	Marine Ecology	5
BIOE 114	Herpetology	5
BIOE 114L	Field Methods in Herpetological Research	2
BIOE 117	Systematic Botany of Flowering Plants	5
BIOE 120	Marine Botany	5
BIOE 120L	Marine Botany Laboratory	2
BIOE 122	Invertebrate Zoology	5
BIOE 122L	Invertebrate Zoology Laboratory	2
BIOE 127	Ichthyology	5
BIOE 127L	Ichthyology Laboratory	2
BIOE 128L	Large Marine Vertebrates Field Course	5
BIOE 129	Biology of Marine Mammals	5

BIOE 129L	Biology of Marine Mammals Laboratory	2
BIOE 137	Molecular Ecology	5
BIOE 141L	Behavioral Ecology Field Course	5
BIOE 145	Plant Ecology	5
BIOE 145L	Field Methods in Plant Ecology	5
BIOE 150L	Ecological Field Methods Laboratory	5
BIOE 151B	Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory	5
BIOE 153C	Disciplinary Communication for Biologists	5
BIOE 158L	Field Methods in Marine Ecology	5
BIOE 159A	Marine Ecology Field Quarter: Marine Ecology with Laboratory	5
BIOE 161L	Kelp Forest Ecology Laboratory	5
BIOE 171	Disciplinary Communication for Biologists	5
BIOE 172	Population Genetics	5

Note: Lecture and 2-credit lab combinations count as a single course. BIOE 117 and BIOE 137 require concurrent enrollment in 2-credit labs, BIOE 117L and BIOE 137L, but these are not part of the DC requirement.

Comprehensive Requirement

All majors in the biological sciences require completion of a comprehensive requirement. This requirement can be satisfied in one of the following ways:

- receiving a passing grade in an independent research course, or field/laboratory course listed below;
- completing a senior thesis;
- achieving a graduate record examination (GRE) score at or above the 50th percentile on the biology subject test or the biochemistry, cell, and molecular biology subject test. Reports of GRE scores must be submitted to the EEB undergraduate advising office before the last day of the graduating quarter;
- obtaining a medical college admission test (MCAT) score at or above the 50th percentile on the biological sciences section. Reports of MCAT scores must be submitted to the EEB undergraduate advising office before the last day of the graduating quarter.

Comprehensive courses offered by Ecology and Evolutionary Biology

BIOE 112L	Ornithology Field Studies	2
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BIOE 114L	Field Methods in Herpetological Research	2	BIOE 159B	Marine Ecology Field Quarter: Ichthyology with Laboratory	5
BIOE 117L	Systematic Botany of Flowering Plants Laboratory	2	BIOE 159C	Marine Ecology Field Quarter: Methods in Field Ecology	5
BIOE 120L	Marine Botany Laboratory	2	BIOE 159D	Marine Ecology Field Quarter: Methods in Field Ecology Laboratory	5
BIOE 122L	Invertebrate Zoology Laboratory	2	BIOE 161L	Kelp Forest Ecology Laboratory	5
BIOE 124L	Mammalogy Laboratory	2	BIOE 163L	Ecology of Reefs, Mangroves, and Seagrasses Laboratory	2
BIOE 127L	Ichthyology Laboratory	2	BIOE 183W	Undergraduate Research in EEB--Writing	2
BIOE 128L	Large Marine Vertebrates Field Course	5	Note: Lab courses may have associated prerequisite or corequisite lecture courses.		
BIOE 129L	Biology of Marine Mammals Laboratory	2	Comprehensive courses offered by Molecular, Cell and Developmental Biology		
BIOE 131L	Animal Physiology Laboratory	2	BIOL 100L	Biochemistry Laboratory	5
BIOE 133L	Exercise Physiology Laboratory	2	BIOL 105L	Eukaryotic Genetics Laboratory	5
BIOE 134L	Comparative Vertebrate Anatomy Laboratory	2	BIOL 109L	Yeast Molecular Genetics Laboratory	5
BIOE 135L	Plant Physiology Laboratory	2	BIOL 115L	Eukaryotic Molecular Biology Laboratory	5
BIOE 137L	Molecular Ecology Laboratory	2	BIOL 120L	Development Laboratory	5
BIOE 141L	Behavioral Ecology Field Course	5	BIOL 121L	Environmental Phage Biology Laboratory	5
BIOE 142L	Animal Behavior in the Wild (A Virtual Field Course)	5	BIOL 186L	Undergraduate Research in MCD Biology	5
BIOE 145L	Field Methods in Plant Ecology	5	BIOL 186R	Undergraduate Research in MCD Biology	5
BIOE 150L	Ecological Field Methods Laboratory	5	BIOL 189	Health Sciences Internship	3
BIOE 151A	Ecology and Conservation in Practice Supercourse: Ecological Field Methods	5	Comprehensive courses offered in other departments		
BIOE 151B	Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory	5	BIOC 110L	Advanced Biochemistry Laboratory	5
BIOE 151C	Ecology and Conservation in Practice Supercourse: Functions and Processes of Terrestrial Ecosystems	5	METX 119L	Microbiology Laboratory	5
BIOE 151D	Ecology and Conservation in Practice Supercourse: Conservation in Practice	4	METX 135L	Functional Anatomy Lab	2
BIOE 153A	Introduction to Arctic Ecology	5	Planners		
BIOE 153B	Arctic Ecology	5	In addition to the specific courses shown in these planners, a student must complete courses satisfying the MF, TA, IM, PE, PR, CC, ER and C campus general education requirements.		
BIOE 153C	Disciplinary Communication for Biologists	5	Sample Frosh Planner		
BIOE 155L	Freshwater Ecology Laboratory	5	1st (frosh)	BIOE 20C	CHEM 1A
BIOE 158L	Field Methods in Marine Ecology	5			STAT 5 or STAT 7 & STAT 7L
BIOE 159A	Marine Ecology Field Quarter: Marine Ecology with Laboratory	5	2nd	BIOL	BIOE BIOL 105

(soph)	20A	20B	
		PHYS 1	
3rd (junior)	BIOE 109 Biology elective *	BIOE 107	Anatomy/Physiology
4th (senior)	Biology elective *	Biolog y electiv e*	Biology elective*

*Electives must be chosen to satisfy the Disciplinary Communication and Comprehensive requirements.

Additional Frosh sample planners may be found on the EEB website.

Sample Transfer Planner

	Fall	Winter	Spring
3rd (junior)	BIOL 105	BIOE 107	Anatomy/Physiology
		BIOE 109	STAT 5 or STAT 7 & STAT 7L
4th (senior)	Biolog y electiv e*	Biolog y electiv e*	Biology elective*
	Biolog y electiv e*	PHYS 1	

*Electives must be chosen to satisfy the Disciplinary Communication and Comprehensive requirements.

Transfer student sample planner

For information on the general biology minor, see Biology B.S. (p. 357) and Biology Minor (p. 377).

ECOLOGY AND EVOLUTION B.S.

Information and Policies

Introduction

The ecology and evolution major focuses on general topics that are not specific to taxonomic group or habitat. As such it provides students with interdisciplinary skills necessary for understanding and solving complex problems in ecology, evolution, behavior, and physiology. All of these disciplines address questions on larger spatial and temporal scales that can be applied to important environmental problems, including genetic and ecological aspects of conservation biology and biodiversity.

Students majoring in ecology and evolution will receive a B.S. degree based on an integrated series of courses providing breadth in fundamental areas of biology and allied sciences that enhance understanding of evolutionary and ecological processes. The capstone of this curriculum is a suite of field courses providing students unique opportunities to learn and conduct research in a host of ecological systems. Students are encouraged to take field courses in their areas of specialization. Other opportunities include participation in research projects with faculty sponsors and the intensive Education Abroad Programs (UCEAP) in Costa Rica (tropical biology) and Australia (marine sciences).

Academic Advising for the Program

Academic advising is available at the Department of Ecology and Evolutionary Biology (EEB) undergraduate advising office located in the Coastal Biology Building on the UC Santa Cruz Coastal Science Campus, and via email at eebadvising@ucsc.edu. The undergraduate webpages contain advice and information pertinent to students' most frequently voiced questions. Each student should review the information posted on the website; for further assistance, contact an EEB undergraduate advisor at eebadvising@ucsc.edu. Transfer students should also review the Transfer Information and Policy Section.

Getting Started in the Major

Prerequisites

The introductory biology sequence is prerequisite to virtually all upper-division biology courses. BIOL 20A (offered by the Molecular, Cell, and Developmental Biology Department) has a prerequisite of CHEM 1A. Therefore, it is essential for students to start chemistry as soon as possible. Students who have not taken CHEM 1A may begin the introductory sequence with BIOE 20C. The entire introductory biology sequence should be taken the first and second year, concurrently with or following the general chemistry sequence. We also strongly recommend completing the lower-division physics requirements early in your academic career.

An online mathematics placement is required to enroll in a mathematics course. Students are expected to take this examination and are encouraged to work in the learning modules until they place into calculus. For more information see the mathematics placement website.

Advanced placement (AP) course equivalencies can be used to fulfill prerequisites.

Program Learning Outcomes

The undergraduate curriculum offered by EEB is designed to ensure that all students declared in any EEB-sponsored major will achieve the following seven program learning outcomes:

1. Students will demonstrate broad-based knowledge of the fundamentals of ecology, behavior, evolution and physiology and the relationships among these disciplines.
2. Students will demonstrate skills in the observation and experimental study of organisms, using both field-based and laboratory-based approaches.
3. Students will demonstrate skills in identifying, accessing, comprehending and synthesizing scientific information, including interpretation of the primary scientific literature. This includes understanding key questions and hypotheses, interpreting results and conclusions, and evaluating quality through critique.
4. Students will demonstrate the ability to conceive and execute independent scientific research, including developing their own questions and hypotheses, designing an appropriate theoretical or empirical/experimental approach, executing that approach, and analyzing and interpreting data.
5. Students will demonstrate an ability to understand and apply fundamental quantitative skills, including models and statistical analyses, so as to properly interpret published research and apply such skills in their own research.
6. Students will demonstrate the ability to communicate scientific work, such as a scientific paper, proposal, essay, or notebook, in written, oral or poster format.
7. Students will exhibit strong teamwork and problem solving skills. They will demonstrate the ability to make arguments from evidence and work together to find optimal solutions.

Major Qualification Policy and Declaration Process

Major Qualification

All courses must be taken for a letter grade. The following qualification courses, or their equivalents, must be completed with a grade of C (2.0) or better:

All of the following courses:

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
BIOL 20A	Cell and Molecular Biology	5

BIOE 20B	Development and Physiology	5
BIOE 20C	Ecology and Evolution	5

And one of the following courses:

MATH 11A	Calculus with Applications	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5

Appeal Process

Students who are not eligible to declare the major may appeal this decision after they have successfully completed the qualification courses by submitting an appeal letter to EEB undergraduate advising. Within 15 business days of receipt of the appeal, the department will notify the student and college of the decision. For more information about the appeal process, see the appeal process website.

How to Declare a Major

Students may submit a petition to declare after successful completion of the qualification policy courses. Students submit their major declaration petition on the EEB website. Students proposed in the major should submit a major declaration petition in the quarter of their major declaration deadline (i.e., sixth quarter for students admitted as frosh). The department will declare the student's major, deny the student admission to the major, or set conditions for admission (provided the conditions may be met within no more than one quarter of enrollment) based on the student's qualification to declare at the time the major declaration petition is received. Information on major declaration can be found here. Additional questions may be directed to eebadvising@ucsc.edu.

Transfer Information and Policy

Transfer Admission Screening Policy

The following courses or their equivalents are required prior to transfer, by the end of the spring term for students planning to enter in the fall.

BIOL 20A	Cell and Molecular Biology	5
BIOE 20B	Development and Physiology	5
BIOE 20C	Ecology and Evolution	5
CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5

Plus, one of the following calculus courses:

MATH 11A	Calculus with Applications	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5

A minimum GPA of 2.0 must be obtained in the courses listed above.

In addition, the following courses are recommended prior to transfer to ensure timely graduation.

CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1

Plus one of the following calculus courses:

MATH 11B	Calculus with Applications	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

Plus one of the following physics courses:

PHYS 6B	Introductory Physics II	5
PHYS 6C	Introductory Physics III	5

Getting Started at UCSC as a Transfer Student

Transfer students who satisfy the major screening requirements may declare the major at any time after matriculation only after their official transcripts have been posted to their MyUCSC student portal by the UCSC Office of Admissions.

Beginning in late June and early July (for fall transfer students) EEB advising will review admitted students' reported transfer course work and determine how it applies to their major's requirements. EEB advising will contact admitted students via email. The email will include information on how students' transfer coursework fulfills major requirements. We will suggest courses for students' fall enrollment and invite you to make an appointment to talk with EEB Undergraduate Advising or direct questions to eebadvising@ucsc.edu. Transfer students may also expect to receive regular email messages from EEB advising in June, July, and August with additional information about the major.

Letter Grade Policy

All courses used to satisfy any major requirement must be taken for a letter grade.

[Optional Catchall]

Course Substitution Policy

To discuss the process for a course substitution, contact an EEB undergraduate advisor.

At least half of the upper-division courses (numbered BIOE 100–BIOE 179) required for each major must be taken in EEB at UC Santa Cruz not as transfer credits from another department or institution.

Transfer students are advised to contact an EEB undergraduate advisor before enrolling in numerous upper-division courses at other institutions. For more information on transferring courses to UC Santa Cruz,

please consult the Transfer Coursework website.

Additional information for transfer students is provided above in the “Transfer Students” section.

Only one upper-division course requirement may be met with a research-based independent study or graduate-level UC Santa Cruz biology course.

Double Majors and Major/Minor Combinations Policy

Students interested in pursuing multiple majors within the biological sciences may not declare any combination of Biology (B.A., B.S., or minor), Ecology and Evolution B.S., Marine Biology B.S., Plant Sciences B.S., or Environmental Studies/Biology B.A. combined major.

Study Abroad

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Many programs are in English-speaking countries or use English for advanced courses. Many programs offer small classes, extensive laboratories, and/or field research experience.

There are excellent programs in Costa Rica, Australia, New Zealand, the United Kingdom, Denmark, and Germany, among others. The Costa Rica Tropical Biology Program is of note to students interested in tropical biology and ecology. Held spring and fall quarters at the Monteverde research station, this program gives students experience with hands-on field research and offers a homestay program. The University of Queensland (Australia) offers an intensive, full-semester marine science program, which includes stays at research stations on the Great Barrier Reef and in sheltered mangrove and seagrass habitats near Brisbane.

Students interested in study abroad need to get an early start on their introductory requirements, including chemistry, mathematics, and biology and must declare their major prior to going abroad. Visit the UCEAP office as soon as possible to begin planning and seek advice and approval for your UCEAP plan from an EEB undergraduate advisor prior to participation in UCEAP.

Honors

Honors in the biological sciences majors are awarded to graduating students whose academic performance demonstrates excellence at a grade point average (GPA) of 3.5 or above. Highest honors are awarded to those students whose performance demonstrates the highest level of excellence and results in a GPA of 3.8 or above.

[Optional Catchall]

Requirements and Planners

Course Requirements**Lower-Division Courses****Introductory Biology:**

BIOI 20A	Cell and Molecular Biology	5
BIOE 20B	Development and Physiology	5
BIOE 20C	Ecology and Evolution	5

General Chemistry:

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2

Calculus:

Choose one of the following options:

Either these courses		
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5
or these courses		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

Biostatistics:

STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

Physics:

Choose one of the following options:

Either these courses		
PHYS 7A	Elementary Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 7B	Elementary Physics II	5
or these courses		
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 6B	Introductory Physics II	5
or these courses		
PHYS 6A	Introductory Physics I	5

PHYS 6L	Introductory Physics I Laboratory	1
PHYS 6C	Introductory Physics III	5

PHYS 7A, PHYS 6L, PHYS 7B: recommended

Upper-Division Courses

A total of 11 upper-division courses, including relevant electives; two must include laboratory or fieldwork; two must apply to the Disciplinary Communication requirement. Courses appearing in more than one category can fulfill only one requirement.

Three upper-division core courses:

BIOI 105	Genetics	5
BIOE 107	Ecology	5
BIOE 109	Evolution	5

One of the following physiology courses:

NOTE: Lecture/lab combinations count as one course.

BIOE 131	Animal Physiology	5
BIOE 131L	Animal Physiology Laboratory	2
BIOE 133	Exercise Physiology	5
BIOE 133L	Exercise Physiology Laboratory	2
BIOE 134	Comparative Vertebrate Anatomy	5
BIOE 134L	Comparative Vertebrate Anatomy Laboratory	2
BIOE 135	Plant Physiology	5
BIOE 135L	Plant Physiology Laboratory	2
BIOE 136	Environmental Physiology	5

BIOE 131/BIOE 131L: lab optional

One of the following organism courses:

NOTE: Lecture/lab combinations count as one course.

BIOE 112	Ornithology	5
BIOE 112L	Ornithology Field Studies	2
BIOE 114	Herpetology	5
BIOE 114L	Field Methods in Herpetological Research	2
BIOE 117	Systematic Botany of Flowering Plants	5
BIOE 117L	Systematic Botany of Flowering Plants Laboratory	2
BIOE 120	Marine Botany	5
BIOE 120L	Marine Botany Laboratory	2
BIOE 122	Invertebrate Zoology	5
BIOE 122L	Invertebrate Zoology Laboratory	2
BIOE 124	Mammalogy	5
BIOE 124L	Mammalogy Laboratory	2
BIOE 127	Ichthyology	5
BIOE 127L	Ichthyology Laboratory	2
BIOE 129	Biology of Marine Mammals	5

BIOE 129L	Biology of Marine Mammals Laboratory	2	BIOE 135L	Plant Physiology Laboratory	2
METX 100	Introduction to Microbiology	5	BIOE 136	Environmental Physiology	5
METX 119	Microbiology	5	BIOE 137	Molecular Ecology	5
METX 119L	Microbiology Laboratory	5	BIOE 137L	Molecular Ecology Laboratory	2
BIOE 129/BIOE 129L: lab required			BIOE 138	Modeling Evolution and Ecology	5
METX 119/METX 119L or METX 100/METX 119L: both lecture and laboratory required			BIOE 139	Mathematical Modeling and Data Science in Ecology and Evolution	5
Electives			BIOE 140	Behavioral Ecology	5
Three topical electives chosen from the following:			BIOE 141L	Behavioral Ecology Field Course	5
NOTE: Lecture and 2-credit lab combinations count as one course.			BIOE 142L	Animal Behavior in the Wild (A Virtual Field Course)	5
BIOE 108	Marine Ecology	5	BIOE 145	Plant Ecology	5
BIOE 112	Ornithology	5	BIOE 145L	Field Methods in Plant Ecology	5
BIOE 112L	Ornithology Field Studies	2	BIOE 147	Community Ecology	5
BIOE 114	Herpetology	5	BIOE 149	Disease Ecology	5
BIOE 114L	Field Methods in Herpetological Research	2	BIOE 150	Ecological Field Methods	5
BIOE 117	Systematic Botany of Flowering Plants	5	BIOE 150L	Ecological Field Methods Laboratory	5
BIOE 117L	Systematic Botany of Flowering Plants Laboratory	2	BIOE 151A	Ecology and Conservation in Practice Supercourse: Ecological Field Methods	5
BIOE 118	Plants and Society: the Biology of Food, Shelter, and Medicine	5	BIOE 151B	Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory	5
BIOE 120	Marine Botany	5	BIOE 151C	Ecology and Conservation in Practice Supercourse: Functions and Processes of Terrestrial Ecosystems	5
BIOE 120L	Marine Botany Laboratory	2	BIOE 151D	Ecology and Conservation in Practice Supercourse: Conservation in Practice	4
BIOE 122	Invertebrate Zoology	5	BIOE 153A	Introduction to Arctic Ecology	5
BIOE 122L	Invertebrate Zoology Laboratory	2	BIOE 153B	Arctic Ecology	5
BIOE 124	Mammalogy	5	BIOE 153C	Disciplinary Communication for Biologists	5
BIOE 124L	Mammalogy Laboratory	2	BIOE 155	Freshwater Ecology	5
BIOE 125	Ecosystems of California	5	BIOE 155L	Freshwater Ecology Laboratory	5
BIOE 126	Biology of Large Marine Vertebrates	5	BIOE 158L	Field Methods in Marine Ecology	5
BIOE 127	Ichthyology	5	BIOE 159A	Marine Ecology Field Quarter: Marine Ecology with Laboratory	5
BIOE 127L	Ichthyology Laboratory	2	BIOE 159B	Marine Ecology Field Quarter: Ichthyology with Laboratory	5
BIOE 128L	Large Marine Vertebrates Field Course	5	BIOE 159C	Marine Ecology Field Quarter: Methods in Field Ecology	5
BIOE 129	Biology of Marine Mammals	5	BIOE 159D	Marine Ecology Field Quarter: Methods in Field Ecology Laboratory	5
BIOE 129L	Biology of Marine Mammals Laboratory	2			
BIOE 131	Animal Physiology	5			
BIOE 131L	Animal Physiology Laboratory	2			
BIOE 133	Exercise Physiology	5			
BIOE 133L	Exercise Physiology Laboratory	2			
BIOE 134	Comparative Vertebrate Anatomy	5			
BIOE 134L	Comparative Vertebrate Anatomy Laboratory	2			
BIOE 135	Plant Physiology	5			

BIOE 159F	Marine Ecology Field Quarter: Global Change Ecology	5	of instructor)		
BIOE 161	Kelp Forest Ecology	5	ENVS	Introduction to	5
BIOE 161L	Kelp Forest Ecology Laboratory	5	104A	Environmental Field Methods	
BIOE 163	Ecology of Reefs, Mangroves, and Seagrasses	5	ENVS	Field Methods Laboratory	2
BIOE 163L	Ecology of Reefs, Mangroves, and Seagrasses Laboratory	2	104L		
BIOE 165	Marine Conservation Biology	5	ENVS	Natural History Field Quarter	5
BIOE 172	Population Genetics	5	107A	Natural History Field	5
BIOL 100	Biochemistry	5	ENVS	Natural History Field Quarter	5
BIOL 101	Molecular Biology	5	107B	Natural History Field	5
BIOL 110	Cell Biology	5	ENVS	Natural History Field Quarter	5
BIOL 115	Eukaryotic Molecular Biology	5	ENVS 108	General Entomology	5
BIOL 120	Developmental Biology	5	ENVS	Geographic Information	5
METX 119	Microbiology	5	115A	Systems and Environmental Applications	
OCEA 118	Marine Microbial Ecology	5	ENVS	Exercises in Geographic Information Systems	2
METX 119L	Microbiology Laboratory	5	ENVS 120	Conservation Biology	5
BIOE 129/BIOE 129L, BIOE 131/BIOE 131L: lab optional			ENVS 122	Tropical Ecology and Conservation	5
Three general electives chosen from the following:			ENVS 123	Animal Ecology and Conservation	5
NOTE: Lecture and 2-credit lab combinations count as one course.			ENVS 129	Integrated Pest Management	5
Biological Sciences-EEB			ENVS	Agroecology and	5
Any upper-division BIOE course numbered BIOE 100- BIOE 179 of 5 or more credits			130A	Sustainable Agriculture	
Biological Sciences-MCDB			ENVS	Agroecology and Sustainable Agriculture Laboratory	2
BIOL 100	Biochemistry	5	ENVS 131	Justice and Sustainability in Agriculture	5
BIOL 101	Molecular Biology	5	ENVS 160	Insect Ecology	5
BIOL 110	Cell Biology	5	ENVS	Restoration Ecology	5
BIOL 115	Eukaryotic Molecular Biology	5	ENVS	Soils and Plant Nutrition	5
BIOL 120	Developmental Biology	5	161A		
Earth Sciences			ENVS 162	Plant Physiological Ecology	5
EART 100	Vertebrate Paleontology	5	ENVS 163	Plant Disease Ecology	5
EART 100L	Vertebrate Paleontology Laboratory	2	ENVS 167	Freshwater and Wetland Ecology	5
EART 101	Invertebrate Paleobiology	5	ENVS 168	Biogeochemistry and the Global Environment	5
EART 101L	Invertebrate Paleobiology Laboratory	1	Microbiology and Environmental Toxicology		
EART 102	Marine Geology	5	METX 100	Introduction to Microbiology	5
EART 105	Coastal Geology	5	METX 119	Microbiology	5
Economics			METX 119L	Microbiology Laboratory	5
ECON 166A	Game Theory and Applications I	5	Ocean Sciences		
ECON 166B	Game Theory and Applications II	5	OCEA 118	Marine Microbial Ecology	5
Environmental Studies (enrollment by permission			OCEA 130	Biological Oceanography	5
			Psychology		
			PSYC 123	Cognitive Neuroscience	5
			Some of these electives may have prerequisites that do not satisfy major or minor requirements.		
			One of the following may also be used as an		

upper-division general elective:**Biological Sciences-EEB**

Any 5 credits of undergraduate research from:

BIOE 183W	Undergraduate Research in EEB--Writing	2
BIOE 183L	Undergraduate Research in EEB	3
BIOE 193	Independent Research in EEB	5
BIOE 193F	Independent Research in EEB	2
BIOE 195	Senior Thesis	5

Environmental Studies

ENVS 183	Environmental Studies Internship	5
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Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division disciplinary communication (DC) requirement. The DC requirement in ecology and evolution is satisfied by completing two of the following ecology and evolutionary biology courses:

NOTE: Lecture and 2-credit lab combinations count as a single course.

BIOE 108	Marine Ecology	5
BIOE 114	Herpetology	5
BIOE 114L	Field Methods in Herpetological Research	2
BIOE 117	Systematic Botany of Flowering Plants	5
BIOE 120	Marine Botany	5
BIOE 120L	Marine Botany Laboratory	2
BIOE 122	Invertebrate Zoology	5
BIOE 122L	Invertebrate Zoology Laboratory	2
BIOE 127	Ichthyology	5
BIOE 127L	Ichthyology Laboratory	2
BIOE 128L	Large Marine Vertebrates Field Course	5
BIOE 129	Biology of Marine Mammals	5
BIOE 129L	Biology of Marine Mammals Laboratory	2
BIOE 137	Molecular Ecology	5
BIOE 141L	Behavioral Ecology Field Course	5
BIOE 145	Plant Ecology	5
BIOE 145L	Field Methods in Plant Ecology	5
BIOE 150L	Ecological Field Methods Laboratory	5
BIOE 151B	Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory	5
BIOE 153C	Disciplinary Communication for Biologists	5

BIOE 158L	Field Methods in Marine Ecology	5
BIOE 159A	Marine Ecology Field Quarter: Marine Ecology with Laboratory	5
BIOE 161L	Kelp Forest Ecology Laboratory	5
BIOE 171	Disciplinary Communication for Biologists	5
BIOE 172	Population Genetics	5

For 2-credit laboratory courses listed above that are taken concurrently with 5-credit lectures, both courses must be passed to receive one half of the DC requirement. BIOE 117 and BIOE 137 require concurrent enrollment in 2-credit labs, BIOE 117L and BIOE 137L, but these are not part of the DC requirement.

Comprehensive Requirement

All majors in the biological sciences require completion of a comprehensive requirement. This requirement can be satisfied in one of the following ways:

- receiving a passing grade in an independent research course, or field/laboratory course listed below;
- completing a senior thesis;
- achieving a graduate record examination (GRE) score at or above the 50th percentile on the biology subject test or the biochemistry, cell, and molecular biology subject test. Reports of GRE scores must be submitted to the EEB undergraduate advising office before the last day of the graduating quarter;
- obtaining a medical college admission test (MCAT) score at or above the 50th percentile on the biological sciences section. Reports of MCAT scores must be submitted to the EEB undergraduate advising office before the last day of the graduating quarter.

Comprehensive courses offered by Ecology and Evolutionary Biology

NOTE: Lab courses may have associated prerequisite or corequisite lecture courses.

BIOE 112L	Ornithology Field Studies	2
BIOE 114L	Field Methods in Herpetological Research	2
BIOE 117L	Systematic Botany of Flowering Plants Laboratory	2
BIOE 120L	Marine Botany Laboratory	2
BIOE 122L	Invertebrate Zoology Laboratory	2
BIOE 124L	Mammalogy Laboratory	2
BIOE 127L	Ichthyology Laboratory	2
BIOE 128L	Large Marine Vertebrates Field Course	5

BIOE 129L	Biology of Marine Mammals Laboratory	2
BIOE 131L	Animal Physiology Laboratory	2
BIOE 133L	Exercise Physiology Laboratory	2
BIOE 134L	Comparative Vertebrate Anatomy Laboratory	2
BIOE 135L	Plant Physiology Laboratory	2
BIOE 137L	Molecular Ecology Laboratory	2
BIOE 141L	Behavioral Ecology Field Course	5
BIOE 145L	Field Methods in Plant Ecology	5
BIOE 150L	Ecological Field Methods Laboratory	5
BIOE 151A	Ecology and Conservation in Practice Supercourse: Ecological Field Methods	5
BIOE 151B	Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory	5
BIOE 151C	Ecology and Conservation in Practice Supercourse: Functions and Processes of Terrestrial Ecosystems	5
BIOE 151D	Ecology and Conservation in Practice Supercourse: Conservation in Practice	4
BIOE 153A	Introduction to Arctic Ecology	5
BIOE 153B	Arctic Ecology	5
BIOE 153C	Disciplinary Communication for Biologists	5
BIOE 155L	Freshwater Ecology Laboratory	5
BIOE 158L	Field Methods in Marine Ecology	5
BIOE 159A	Marine Ecology Field Quarter: Marine Ecology with Laboratory	5
BIOE 159B	Marine Ecology Field Quarter: Ichthyology with Laboratory	5
BIOE 159C	Marine Ecology Field Quarter: Methods in Field Ecology	5
BIOE 159D	Marine Ecology Field Quarter: Methods in Field Ecology Laboratory	5
BIOE 161L	Kelp Forest Ecology Laboratory	5
BIOE 163L	Ecology of Reefs, Mangroves, and Seagrasses Laboratory	2
BIOE 183W	Undergraduate Research in EEB--Writing	2

Comprehensive courses offered by Molecular, Cell and Developmental Biology

BIOL 100L	Biochemistry Laboratory	5
BIOL 105L	Eukaryotic Genetics Laboratory	5
BIOL 109L	Yeast Molecular Genetics Laboratory	5
BIOL 115L	Eukaryotic Molecular Biology Laboratory	5
BIOL 120L	Development Laboratory	5
BIOL 121L	Environmental Phage Biology Laboratory	5
BIOL 186L	Undergraduate Research in MCD Biology	5
BIOL 186R	Undergraduate Research in MCD Biology	5
BIOL 189	Health Sciences Internship	3

Comprehensive courses offered in other departments

BIOC 110L	Advanced Biochemistry Laboratory	5
METX 119L	Microbiology Laboratory	5
CRSN 152	IDEASS Laboratory Practicum	2

Planners

In addition to the specific courses shown in these planners, a student must complete courses satisfying the IM, TA, PE, PR, CC, ER and C campus general education requirements.

Sample Frosh Planner

1st (frosh)	BIOE 20C	MATH 11A or MATH 19A	MATH 11B or MATH 19B
		CHEM 1A	CHEM 1B
2nd (soph)	BIOL 20A	BIOE 20B	STAT 7 & STAT 7L
	CHEM 1C & CHEM 1N	PHYS 6A & PHYS 6L	PHYS 6B or PHYS 6C
3rd (junior)	BIOL 105	Physiology core	BIOE 109
	BIOE 107	*ECEV topical elective	Organismal core
4th (senior)	*ECEV topical elective	*ECEV topical elective	EEB general elective

EEB
general
elective

EEB
general
elective

*ECEV = Ecology and Evolution B.S.

Electives must be chosen to satisfy the Disciplinary Communication and Comprehensive requirements.

Additional Fresh sample planners may be found on the EEB website.

Sample Transfer Planner

For students who transferred in after completing the transfer screening courses and:

- MATH 11B
- CHEM 1C & CHEM 1N
- PHYS 6A & PHYS 6L, and PHYS 6B or PHYS 6C

	Fall	Winter	Spring
3rd (junior)	BIOL 105	BIOE 107	BIOE 109
	*ECEV topical elective	*ECEV topical elective	EEB general elective
	STAT 7 & STAT 7L		
4th (senior)	Organismal core	*ECEV topical elective	Physiology core
	EEB general elective	EEB general elective	

*ECEV = Ecology and Evolution B.S.

Electives must be chosen to satisfy the Disciplinary Communication and Comprehensive requirements.

Additional Transfer student sample planners may be found on the EEB website.

MARINE BIOLOGY B.S.

Information and Policies

Introduction

The marine biology major is designed to introduce students to the great diversity of marine organisms and the biological and physical processes that affect these organisms, their populations, and their coastal and oceanic ecosystems. Curricular emphasis is on basic principles that help in understanding the processes that

shape life in marine environments. The Department of Ecology and Evolutionary Biology (EEB) is located on UC Santa Cruz's Coastal Science Campus (CSC). CSC is situated on Monterey Bay and its great diversity of coastal marine ecosystems, nature reserves, and state, federal, and private marine research institutions and management agencies. Both the National Marine Fisheries Service and the California Department of Fish and Game have laboratories located on the CSC, providing students with research and internship opportunities. Long Marine Laboratory on the CSC provides logistical support including diving and boating facilities, running seawater systems, and marine mammal facilities. Descriptions of nearby environments, institutions, and facilities are available through the EEB Department website. These resources, combined with computing and analytical facilities on main campus and the CSC, make for exceptional opportunities for the study of marine biology and its application to coastal conservation and management. Students can readily engage in basic and applied (e.g., fisheries management) research from estuaries to the deep sea, and plankton to whales.

Academic Advising for the Program

Academic advising is available at the Department of Ecology and Evolutionary Biology (EEB) undergraduate advising office located in the Coastal Biology Building on the UC Santa Cruz Coastal Science Campus, and via email at eebadvising@ucsc.edu. The undergraduate webpages contain advice and information pertinent to students' most frequently voiced questions. Each student should review the information posted on the website; for further assistance, contact an EEB undergraduate advisor at eebadvising@ucsc.edu. Transfer students should also review the Transfer Information and Policy Section.

Getting Started in the Major

Prerequisites

The introductory biology sequence is prerequisite to virtually all upper-division biology courses. BIOL 20A (offered by the Molecular, Cell, and Developmental Biology Department) has a prerequisite of CHEM 1A. Therefore, it is essential for students to start chemistry as soon as possible. Students who have not taken CHEM 1A may begin the introductory sequence with BIOE 20C. The entire introductory biology sequence should be taken the first and second year, concurrently with or following the general chemistry sequence. We also strongly recommend completing the lower-division physics requirements early in your academic career.

An online mathematics placement is required to enroll in a mathematics course. Students are expected to take this examination and are encouraged to work in the learning modules until they place into calculus. For more information see the mathematics placement website.

Advanced placement (AP) course equivalencies can be used to fulfill prerequisites.

Program Learning Outcomes

The undergraduate curriculum offered by the Department of Ecology and Evolutionary Biology (EEB) is designed to ensure that all students declared in any EEB sponsored major will achieve the following seven program learning outcomes.

1. Students will demonstrate broad-based knowledge of the fundamentals of ecology, behavior, evolution and physiology and the relationships among these disciplines.
2. Students will demonstrate skills in the observation and experimental study of organisms, using both field-based and laboratory-based approaches.
3. Students will demonstrate skills in identifying, accessing, comprehending and synthesizing scientific information, including interpretation of the primary scientific literature. This includes understanding key questions and hypotheses, interpreting results and conclusions, and evaluating quality through critique.
4. Students will demonstrate the ability to conceive and execute independent scientific research, including developing their own questions and hypotheses, designing an appropriate theoretical or empirical/experimental approach, executing that approach, and analyzing and interpreting data.
5. Students will demonstrate an ability to understand and apply fundamental quantitative skills, including models and statistical analyses, so as to properly interpret published research and apply such skills in their own research.
6. Students will demonstrate the ability to communicate scientific work, such as a scientific paper, proposal, essay, or notebook, in written, oral or poster format.
7. Students will exhibit strong teamwork and problem solving skills. They will demonstrate the ability to make arguments from evidence and work together to find optimal solutions.

Major Qualification Policy and Declaration Process

Major Qualification

All courses must be taken for a letter grade. The following qualification courses, or their equivalents, must be completed with a grade of C (2.0) or better:

All of the following courses:

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
BIOL 20A	Cell and Molecular Biology	5
BIOE 20B	Development and Physiology	5
BIOE 20C	Ecology and Evolution	5

And one of the following courses:

MATH 11A	Calculus with Applications	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5

Appeal Process

Students who are not eligible to declare the major may appeal this decision after they have successfully completed the qualification courses by submitting an appeal letter to EEB undergraduate advising. Within 15 business days of receipt of the appeal, the department will notify the student and college of the decision. For more information about the appeal process, see the appeal process website.

How to Declare a Major

Students may submit a petition to declare after successful completion of the qualification policy courses. Students submit their major declaration petition on the EEB website. Students proposed in the major should submit a major declaration petition in the quarter of their major declaration deadline (i.e., sixth quarter for students admitted as frosh). The department will declare the student's major, deny the student admission to the major, or set conditions for admission (provided the conditions may be met within no more than one quarter of enrollment) based on the student's qualification to declare at the time the major declaration petition is received. Information on major declaration can be found here. Additional questions may be directed to eebadvising@ucsc.edu.

Transfer Information and Policy

Transfer Admission Screening Policy

The following courses or their equivalents are required prior to transfer, by the end of the spring term for students planning to enter in the fall.

BIOL 20A	Cell and Molecular Biology	5
BIOE 20B	Development and Physiology	5
BIOE 20C	Ecology and Evolution	5
CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5

Plus, one of the following calculus courses:

MATH 11A	Calculus with Applications	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5

A minimum GPA of 2.0 must be obtained in the courses listed above.

In addition, the following courses are recommended prior to transfer to ensure timely

graduation.

CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1

Plus one of the following calculus courses:

MATH 11B	Calculus with Applications	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

Click here for more information on qualifying for the major as a transfer applicant . Click here for additional transfer preparation information.

Plus one of the following physics courses:

PHYS 6B	Introductory Physics II	5
PHYS 6C	Introductory Physics III	5

Getting Started at UCSC as a Transfer Student

Transfer students who satisfy the major screening requirements may declare the major at any time after matriculation only after their official transcripts have been posted to their MyUCSC student portal by the UCSC Office of Admissions.

Beginning in late June and early July (for fall transfer students) EEB advising will review admitted students' reported transfer course work and determine how it applies to their major's requirements. EEB advising will contact admitted students via email. The email will include information on how students' transfer coursework fulfills major requirements. We will suggest courses for students' Fall enrollment, and invite you to make an appointment to talk with EEB undergraduate advising or direct questions to eebadvising@ucsc.edu. Transfer students may also expect to receive regular email messages from EEB advising in June, July, and August with additional information about the major.

Letter Grade Policy

All courses used to satisfy any major requirement must be taken for a letter grade.

[Optional Catchall]**Course Substitution Policy**

To discuss the process for a course substitution, contact an EEB undergraduate advisor.

At least half of the upper-division courses (numbered BIOE 100–BIOE 179) required for each major must be taken in EEB at UC Santa Cruz not as transfer credits from another department or institution.

Transfer students are advised to contact an EEB undergraduate advisor before enrolling in numerous

upper-division courses at other institutions. For more information on transferring courses to UC Santa Cruz, please consult the Transfer Coursework website. Additional information for transfer students is provided above in the “Transfer Students” section.

Only one upper-division course requirement may be met with a research-based independent study or graduate-level UC Santa Cruz biology course.

Double Majors and Major/Minor Combinations Policy

Students interested in pursuing multiple majors within the biological sciences may not declare any combination of biology (B.A., B.S., or minor), ecology and evolution B.S., marine biology B.S., plant sciences B.S., or environmental studies/biology B.A. combined major.

Study Abroad

The UC Education Abroad Program (UCEAP) offers qualified students unique opportunities to broaden their educational horizons. The EEB Department encourages interested students to participate. It is possible to satisfy major requirements abroad and graduate on time; consult with an EEB undergraduate advisor early in the planning process.

Many programs are in English-speaking countries or use English for advanced courses. Many programs offer small classes, extensive laboratories, and/or field research experience.

There are excellent programs in Costa Rica, Australia, New Zealand, the United Kingdom, Denmark, and Germany, among others. The Costa Rica Tropical Biology Program is of note to students interested in tropical biology and ecology. Held spring and fall quarters at the Monteverde research station, this program gives students experience with hands-on field research and offers a homestay program. The University of Queensland (Australia) offers an intensive, full-semester marine science program, which includes stays at research stations on the Great Barrier Reef and in sheltered mangrove and seagrass habitats near Brisbane.

Students interested in study abroad need to get an early start on their introductory requirements, including chemistry, mathematics, and biology and must declare their major prior to going abroad. Visit the UCEAP office as soon as possible to begin planning and seek advice and approval for your UCEAP plan from an EEB undergraduate advisor prior to participation in UCEAP.

Honors

Honors in the biological sciences majors are awarded to graduating students whose academic performance demonstrates excellence at a grade point average (GPA) of 3.5 or above. Highest honors are awarded to those students whose performance demonstrates the highest level of excellence and results in a GPA of 3.8 or above.

[Optional Catchall]**Requirements and Planners****Course Requirements****Lower-Division Courses****Introductory Biology:**

BIOL 20A	Cell and Molecular Biology	5
BIOE 20B	Development and Physiology	5
BIOE 20C	Ecology and Evolution	5

General Chemistry:

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2

Calculus:

Choose one of the following options:

Either these courses		
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5

or these courses		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

Biostatistics:

STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

Physics:

Choose one of the following options:

Either these courses		
PHYS 7A	Elementary Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 7B	Elementary Physics II	5
or these courses		
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 6B	Introductory Physics II	5

or these courses

PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 6C	Introductory Physics III	5

PHYS 7A, PHYS 6L, PHYS 7B: recommended

Upper-Division Courses

A total of 11 upper-division courses, including relevant electives; two must include laboratory or fieldwork; two must apply to the Disciplinary Communication requirement. Courses appearing in more than one category can fulfill only one requirement.

Two core courses:

BIOL 105	Genetics	5
BIOE 109	Evolution	5

One ecology course:

BIOE 107	Ecology	5
BIOE 108	Marine Ecology	5

One marine-environment course:

OCEA 101	The Marine Environment	5
OCEA 130	Biological Oceanography	5

One marine course:

Note: Lecture/lab combinations count as one course

BIOE 120	Marine Botany	5
BIOE 120L	Marine Botany Laboratory	2
BIOE 122	Invertebrate Zoology	5
BIOE 122L	Invertebrate Zoology Laboratory	2
BIOE 126	Biology of Large Marine Vertebrates	5
BIOE 127	Ichthyology	5
BIOE 127L	Ichthyology Laboratory	2
BIOE 129	Biology of Marine Mammals	5
BIOE 129L	Biology of Marine Mammals Laboratory	2

BIOE 129/BIOE 129L: lab optional

Electives**Three topical electives chosen from the following:**

Note: Lecture and 2-credit lab combinations count as one course.

BIOE 108	Marine Ecology	5
BIOE 120	Marine Botany	5
BIOE 120L	Marine Botany Laboratory	2
BIOE 122	Invertebrate Zoology	5
BIOE 122L	Invertebrate Zoology Laboratory	2
BIOE 126	Biology of Large Marine Vertebrates	5
BIOE 127	Ichthyology	5
BIOE 127L	Ichthyology Laboratory	2

BIOE 128L	Large Marine Vertebrates Field Course	5	EART 101	Invertebrate Paleobiology	5
BIOE 129	Biology of Marine Mammals	5	EART 101L	Invertebrate Paleobiology Laboratory	1
BIOE 129L	Biology of Marine Mammals Laboratory	2	EART 102	Marine Geology	5
BIOE 136	Environmental Physiology	5	EART 105	Coastal Geology	5
BIOE 155	Freshwater Ecology	5	Economics		
BIOE 155L	Freshwater Ecology Laboratory	5	ECON	Game Theory and Applications I	5
BIOE 158L	Field Methods in Marine Ecology	5	ECON 166A	Game Theory and Applications II	5
BIOE 159A	Marine Ecology Field Quarter: Marine Ecology with Laboratory	5	Environmental Studies (enrollment by permission of instructor)		
BIOE 159B	Marine Ecology Field Quarter: Ichthyology with Laboratory	5	ENVS 104A	Introduction to Environmental Field Methods	5
BIOE 159C	Marine Ecology Field Quarter: Methods in Field Ecology	5	ENVS 104L	Field Methods Laboratory	2
BIOE 159D	Marine Ecology Field Quarter: Methods in Field Ecology Laboratory	5	ENVS 107A	Natural History Field Quarter	5
BIOE 159F	Marine Ecology Field Quarter: Global Change Ecology	5	ENVS 107B	Natural History Field Quarter	5
BIOE 161	Kelp Forest Ecology	5	ENVS 107C	Natural History Field Quarter	5
BIOE 161L	Kelp Forest Ecology Laboratory	5	ENVS 108	General Entomology	5
BIOE 163	Ecology of Reefs, Mangroves, and Seagrasses	5	ENVS	Geographic Information Systems and Environmental Applications	5
BIOE 163L	Ecology of Reefs, Mangroves, and Seagrasses Laboratory	2	ENVS 115A	Exercises in Geographic Information Systems	2
BIOE 165	Marine Conservation Biology	5	ENVS 120	Conservation Biology	5
EART 102	Marine Geology	5	ENVS 122	Tropical Ecology and Conservation	5
EART 105	Coastal Geology	5	ENVS 123	Animal Ecology and Conservation	5
OCEA 118	Marine Microbial Ecology	5	ENVS 129	Integrated Pest Management	5
OCEA 130	Biological Oceanography	5	ENVS 130A	Agroecology and Sustainable Agriculture	5
Three general electives chosen from the following:			ENVS 130L	Sustainable Agriculture Laboratory	5
Note: Lecture/lab combinations count as one course			ENVS 130B	Justice and Sustainability in Agriculture	5
Biological Sciences-EEB			ENVS 131	Insect Ecology	5
Any upper-division BIOE course numbered BIOE 100- BIOE 179 of 5 or more credits			ENVS 160	Restoration Ecology	5
Biological Sciences-MCDB			ENVS 161A	Soils and Plant Nutrition	5
BIOL 100	Biochemistry	5	ENVS 162	Plant Physiological Ecology	5
BIOL 101	Molecular Biology	5	ENVS 163	Plant Disease Ecology	5
BIOL 110	Cell Biology	5	ENVS 167	Freshwater and Wetland Ecology	5
BIOL 115	Eukaryotic Molecular Biology	5	ENVS 168	Biogeochemistry and the Global Environment	5
BIOL 120	Developmental Biology	5	Microbiology and Environmental Toxicology		
Earth and Planetary Sciences			METX 100	Introduction to Microbiology	5
EART 100	Vertebrate Paleontology	5	METX 119	Microbiology	5
EART 100L	Vertebrate Paleontology Laboratory	2	METX 119L	Microbiology Laboratory	5

Ocean Sciences

OCEA 118	Marine Microbial Ecology	5
OCEA 130	Biological Oceanography	5

Psychology

PSYC 123	Cognitive Neuroscience	5
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Some of these electives may have prerequisites that do not satisfy major or minor requirements.

One of the following may also be used as an upper-division general elective:

Biological Sciences-EEB

Any 5 credits of undergraduate research

BIOE 183W	Undergraduate Research in EEB--Writing	2
BIOE 183L	Undergraduate Research in EEB	3
BIOE 193	Independent Research in EEB	5
BIOE 193F	Independent Research in EEB	2
BIOE 195	Senior Thesis	5

Environmental Studies

ENVS 183	Environmental Studies Internship	5
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Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division disciplinary communication (DC) Requirement. The DC requirement in marine biology is satisfied by completing two of the following ecology and evolutionary biology courses:

Note: Lecture and 2-credit lab combinations count as a single course.

BIOE 108	Marine Ecology	5
BIOE 114	Herpetology	5
BIOE 114L	Field Methods in Herpetological Research	2
BIOE 117	Systematic Botany of Flowering Plants	5
BIOE 120	Marine Botany	5
BIOE 120L	Marine Botany Laboratory	2
BIOE 122	Invertebrate Zoology	5
BIOE 122L	Invertebrate Zoology Laboratory	2
BIOE 127	Ichthyology	5
BIOE 127L	Ichthyology Laboratory	2
BIOE 128L	Large Marine Vertebrates Field Course	5
BIOE 129	Biology of Marine Mammals	5
BIOE 129L	Biology of Marine Mammals Laboratory	2
BIOE 137	Molecular Ecology	5
BIOE 141L	Behavioral Ecology Field Course	5
BIOE 145	Plant Ecology	5

BIOE 145L	Field Methods in Plant Ecology	5
BIOE 150L	Ecological Field Methods Laboratory	5
BIOE 151B	Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory	5
BIOE 153C	Disciplinary Communication for Biologists	5
BIOE 158L	Field Methods in Marine Ecology	5
BIOE 159A	Marine Ecology Field Quarter: Marine Ecology with Laboratory	5
BIOE 161L	Kelp Forest Ecology Laboratory	5
BIOE 171	Disciplinary Communication for Biologists	5
BIOE 172	Population Genetics	5

For 2-credit laboratory courses listed above that are taken concurrently with 5-credit lectures, both courses must be passed to receive one half of the DC requirement. BIOE 117 and BIOE 137 require concurrent enrollment in 2-credit labs, BIOE 117L and BIOE 137L, but these are not part of the DC requirement.

Comprehensive Requirement

All majors in the biological sciences require completion of a comprehensive requirement. This requirement can be satisfied in one of the following ways:

- receiving a passing grade in an independent research course, or field/laboratory course listed below;
- completing a senior thesis;
- achieving a graduate record examination (GRE) score at or above the 50th percentile on the biology subject test or the biochemistry, cell, and molecular biology subject test. Reports of GRE scores must be submitted to the EEB undergraduate advising office before the last day of the graduating quarter;
- obtaining a medical college admission test (MCAT) score at or above the 50th percentile on the biological sciences section. Reports of MCAT scores must be submitted to the EEB undergraduate advising office before the last day of the graduating quarter.

Comprehensive courses offered by Ecology and Evolutionary Biology

Note: Lab courses may have associated prerequisite or corequisite lecture courses.

BIOE 112L	Ornithology Field Studies	2
BIOE 114L	Field Methods in Herpetological Research	2

	CHEM 1N		PHYS 6L
3rd (junior)	BIOE 109	BIOE 107 or BIOE 108	EEB general elective
	PHYS 6C	Marine core	*MABI topical elective
4th (senior)	BIOE 109	Marine environment core	EEB general elective
	*MABI topical elective	*MABI topical elective	EEB general elective

*MABI = Marine Biology B.S.

Electives must be chosen to satisfy the Disciplinary Communication and Comprehensive requirements.

Additional Frosh sample planners may be found on the EEB website.

Sample Transfer Planner

For students who transferred in after completing the transfer screening courses and:

- MATH 11B
- CHEM 1C & CHEM 1N
- PHYS 6A & PHYS 6L, and PHYS 6B or PHYS 6C

	Fall	Winter	Spring
3rd (junior)	BIOL 105	BIOE 107 or BIOE 108	BIOE 109
	*MABI topical elective	*MABI topical elective	*MABI topical elective
	STAT 7 & STAT 7L		
4th (senior)	Marine core	Marine environment core	EEB general elective
	EEB general elective	EEB general elective	

*MABI = Marine Biology B.S.

Electives must be chosen to satisfy the Disciplinary Communication and Comprehensive requirements.

Additional Transfer sample planners may be found on the EEB website.

PLANT SCIENCES B.S.

Information and Policies

Introduction

UC Santa Cruz has a strong program in the plant sciences (sometimes called botany). Resources that support the plant sciences major include state-of-the-art greenhouse facilities, natural ecosystems on the campus from coastal wetlands to redwood forests, the collections of the UCSC Arboretum, and the Center for Agroecology and Sustainable Food Systems (including the UC Santa Cruz Farm and Garden). A hallmark of the major is the many field courses that introduce students to a diversity of terrestrial and aquatic ecosystems and the skills to conduct field research. See the Ecology & Evolutionary Biology undergraduate webpage for more information on these courses.

The plant sciences major is designed for students with an interest in plant biology and its associated curricular fields such as plant ecology and evolution, plant physiology, plant pathology, plant genetics, soils, and applied plant sciences. After completion of the core courses, students can proceed in one of several directions depending on their interests. For example, a more in-depth study of physiology and evolution courses can serve as preparation for work in biotechnology or plant breeding; further studies in plant ecology, tropical ecology, or restoration ecology can lead to careers in resource ecology and management or biodiversity exploration; upper-division training in agroecology can lead to careers in agriculture or food systems. There are many opportunities for internships both on the UC Santa Cruz campus and in the greater community.

Academic Advising for the Program

Academic advising is available at the Department of Ecology and Evolutionary Biology (EEB) undergraduate advising office located in the Coastal Biology Building on the UC Santa Cruz Coastal Science Campus, and via email at eebadvising@ucsc.edu. The undergraduate webpages contain advice and information pertinent to students' most frequently voiced questions. Each student should review the information posted on the website; for further assistance, contact an EEB undergraduate advisor at eebadvising@ucsc.edu. Transfer students should also review the Transfer Information and Policy Section.

Getting Started in the Major

Prerequisites

The introductory biology sequence is prerequisite to virtually all upper-division biology courses. BIOL 20A (offered by the Molecular, Cell, and Developmental

Biology Department) has a prerequisite of CHEM 1A. Therefore, it is essential for students to start chemistry as soon as possible. Students who have not taken CHEM 1A may begin the introductory sequence with BIOE 20C. The entire introductory biology sequence should be taken the first and second year, concurrently with or following the general chemistry sequence. We also strongly recommend completing the lower-division physics requirements early in your academic career.

An online mathematics placement is required to enroll in a mathematics course. Students are expected to take this examination and are encouraged to work in the learning modules until they place into calculus. For more information see the mathematics placement website.

Advanced placement (AP) course equivalencies can be used to fulfill prerequisites.

Program Learning Outcomes

The undergraduate curriculum offered by the Department of Ecology and Evolutionary Biology (EEB) is designed to ensure that all students declared in any EEB-sponsored major will achieve the following seven program learning outcomes:

1. Students will demonstrate broad-based knowledge of the fundamentals of ecology, behavior, evolution and physiology and the relationships among these disciplines.
2. Students will demonstrate skills in the observation and experimental study of organisms, using both field-based and laboratory-based approaches.
3. Students will demonstrate skills in identifying, accessing, comprehending and synthesizing scientific information, including interpretation of the primary scientific literature. This includes understanding key questions and hypotheses, interpreting results and conclusions, and evaluating quality through critique.
4. Students will demonstrate the ability to conceive and execute independent scientific research, including developing their own questions and hypotheses, designing an appropriate theoretical or empirical/experimental approach, executing that approach, and analyzing and interpreting data.
5. Students will demonstrate an ability to understand and apply fundamental quantitative skills, including models and statistical analyses, so as to properly interpret published research and apply such skills in their own research.
6. Students will demonstrate the ability to communicate scientific work, such as a scientific paper, proposal, essay, or notebook, in written, oral or poster format.
7. Students will exhibit strong teamwork and problem solving skills. They will demonstrate the ability to

make arguments from evidence and work together to find optimal solutions.

Major Qualification Policy and Declaration Process

Major Qualification

All courses must be taken for a letter grade. The following qualification courses, or their equivalents, must be completed with a grade of C (2.0) or better:

All of the following courses:

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
BIOL 20A	Cell and Molecular Biology	5
BIOE 20B	Development and Physiology	5
BIOE 20C	Ecology and Evolution	5

And one of the following courses:

MATH 11A	Calculus with Applications	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5

Appeal Process

Students who are not eligible to declare the major may appeal this decision after they have successfully completed the qualification courses by submitting an appeal letter to EEB undergraduate advising. Within 15 business days of receipt of the appeal, the department will notify the student and college of the decision. For more information about the appeal process, see the appeal process website.

How to Declare a Major

Students may submit a petition to declare after successful completion of the qualification policy courses. Students submit their major declaration petition on the EEB website. Students proposed in the major should submit a major declaration petition in the quarter of their major declaration deadline (i.e., sixth quarter for students admitted as frosh). The department will declare the student's major, deny the student admission to the major, or set conditions for admission (provided the conditions may be met within no more than one quarter of enrollment) based on the student's qualification to declare at the time the major declaration petition is received. Information on major declaration can be found here. Additional questions may be directed to eebadvising@ucsc.edu.

Transfer Information and Policy

Transfer Admission Screening Policy

The following courses or their equivalents are required prior to transfer, by the end of the spring term for students planning to enter in the fall.

BIOL 20A	Cell and Molecular Biology	5
BIOE 20B	Development and Physiology	5
BIOE 20C	Ecology and Evolution	5
CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5

Plus, one of the following calculus courses:

MATH 11A	Calculus with Applications	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5

A minimum GPA of 2.0 must be obtained in the courses listed above.

In addition, the following courses are recommended prior to transfer to ensure timely graduation.

CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1

Plus one of the following calculus courses:

MATH 11B	Calculus with Applications	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

Plus one of the following physics courses:

PHYS 6B	Introductory Physics II	5
PHYS 6C	Introductory Physics III	5

Getting Started at UCSC as a Transfer Student

Transfer students who satisfy the major screening requirements may declare the major at any time after matriculation only after their official transcripts have been posted to their MyUCSC student portal by the UCSC Office of Admissions.

Beginning in late June and early July (for fall transfer students) EEB advising will review admitted students' reported transfer course work and determine how it applies to their major's requirements. EEB advising will contact admitted students via email. The email will include information on how students' transfer coursework fulfills major requirements. We will suggest courses for students' fall enrollment, and invite you to make an appointment to talk with EEB undergraduate advising or direct questions to eebadvising@ucsc.edu. Transfer students may also expect to receive regular email messages from EEB advising in June, July, and August with additional information about the major.

Letter Grade Policy

All courses used to satisfy any major requirement must be taken for a letter grade.

[Optional Catchall]

Course Substitution Policy

To discuss the process for a course substitution, contact an EEB undergraduate advisor.

At least half of the upper-division courses (numbered BIOE 100–BIOE 179) required for each major must be taken in EEB at UC Santa Cruz not as transfer credits from another department or institution.

Transfer students are advised to contact an EEB undergraduate advisor before enrolling in numerous upper-division courses at other institutions. For more information on transferring courses to UCSC, please consult the Transfer Coursework website. Additional information for transfer students is provided above in the “Transfer Students” section.

Only one upper-division course requirement may be met with a research-based independent study or graduate-level UCSC biology course.

Double Majors and Major/Minor Combinations Policy

Students interested in pursuing multiple majors within the biological sciences may not declare any combination of Biology (B.A., B.S., or minor), Ecology and Evolution B.S., Marine Biology B.S., Plant Sciences B.S., or Environmental Studies/Biology B.A. combined major.

Study Abroad

The UC Education Abroad Program (UCEAP) offers qualified students unique opportunities to broaden their educational horizons. The EEB Department encourages interested students to participate. It is possible to satisfy major requirements abroad and graduate on time; consult with an EEB undergraduate advisor early in the planning process.

Many programs are in English-speaking countries or use English for advanced courses. Many programs offer small classes, extensive laboratories, and/or field research experience.

There are excellent programs in Costa Rica, Australia, New Zealand, the United Kingdom, Denmark, and Germany, among others. The Costa Rica Tropical Biology Program is of note to students interested in tropical biology and ecology. Held spring and fall quarters at the Monteverde research station, this program gives students experience with hands-on field research and offers a homestay program. The University of Queensland (Australia) offers an intensive, full-semester marine science program, which includes stays at research stations on the Great Barrier Reef and in sheltered mangrove and seagrass habitats near Brisbane.

Students interested in study abroad need to get an early start on their introductory requirements, including chemistry, mathematics, and biology and must declare their major prior to going abroad. Visit the UCEAP office as soon as possible to begin planning and seek advice and approval for your UCEAP plan from an EEB undergraduate advisor prior to participation in UCEAP.

Honors

Honors in the biological sciences majors are awarded to graduating students whose academic performance demonstrates excellence at a grade point average (GPA) of 3.5 or above. Highest honors are awarded to those students whose performance demonstrates the highest level of excellence and results in a GPA of 3.8 or above.

[Optional Catchall]

Requirements and Planners

Course Requirements

Lower-Division Courses

Introductory Biology:

BIOL 20A	Cell and Molecular Biology	5
BIOE 20B	Development and Physiology	5
BIOE 20C	Ecology and Evolution	5

General Chemistry:

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2

Calculus:

Choose one of the following options:

Either these courses		
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5
or these courses		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

Biostatistics:

STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental,	2

and Health Sciences Laboratory

Physics:

Choose one of the following options:

Either these courses		
PHYS 7A	Elementary Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 7B	Elementary Physics II	5
or these courses		
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 6B	Introductory Physics II	5
or these courses		
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 6C	Introductory Physics III	5

PHYS 7A, PHYS 6L, PHYS 7B: recommended

Upper-Division Courses

A total of 11 upper-division courses, including relevant electives; two must include laboratory or fieldwork; two must apply to the Disciplinary Communication requirement. Courses appearing in more than one category can fulfill only one requirement.

Two core courses:

BIOL 105	Genetics	5
BIOE 109	Evolution	5

One Ecology Course

BIOE 107	Ecology	5
BIOE 145	Plant Ecology	5

One plant physiology course from the following:

Note: Lecture/lab combinations count as one course

BIOE 135	Plant Physiology	5
BIOE 135L	Plant Physiology Laboratory	2
ENVS 162	Plant Physiological Ecology	5

One botany course from the following:

Note: Lecture/lab combinations count as one course

BIOE 117	Systematic Botany of Flowering Plants	5
BIOE 117L	Systematic Botany of Flowering Plants Laboratory	2
BIOE 120	Marine Botany	5
BIOE 120L	Marine Botany Laboratory	2

Electives**Three topical electives chosen from the following:**

Note: Lecture and 2-credit lab combinations count as one course.

Biological Sciences-EEB

BIOE 117	Systematic Botany of Flowering Plants	5
BIOE 117L	Systematic Botany of Flowering Plants Laboratory	2
BIOE 118	Plants and Society: the Biology of Food, Shelter, and Medicine	5
BIOE 120	Marine Botany	5
BIOE 120L	Marine Botany Laboratory	2
BIOE 125	Ecosystems of California	5
BIOE 135	Plant Physiology	5
BIOE 135L	Plant Physiology Laboratory	2
BIOE 137	Molecular Ecology	5
BIOE 137L	Molecular Ecology Laboratory	2
BIOE 138	Modeling Evolution and Ecology	5
BIOE 139	Mathematical Modeling and Data Science in Ecology and Evolution	5
BIOE 145	Plant Ecology	5
BIOE 145L	Field Methods in Plant Ecology	5
BIOE 149	Disease Ecology	5
BIOE 151A	Ecology and Conservation in Practice Supercourse: Ecological Field Methods	5
BIOE 151B	Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory	5
BIOE 151C	Ecology and Conservation in Practice Supercourse: Functions and Processes of Terrestrial Ecosystems	5
BIOE 151D	Ecology and Conservation in Practice Supercourse: Conservation in Practice	4
BIOE 153A	Introduction to Arctic Ecology	5
BIOE 153B	Arctic Ecology	5
BIOE 153C	Disciplinary Communication for Biologists	5
BIOE 161	Kelp Forest Ecology	5
BIOE 161L	Kelp Forest Ecology Laboratory	5

Biological Sciences-MCDB

BIOE 100	Biochemistry	5
BIOE 101	Molecular Biology	5
BIOE 110	Cell Biology	5

BIOE 115	Eukaryotic Molecular Biology	5
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Environmental Studies (enrollment by permission of instructor)

ENVS 104A	Introduction to Environmental Field Methods	5
ENVS 104L	Field Methods Laboratory	2
ENVS 129	Integrated Pest Management	5
ENVS 130A	Agroecology and Sustainable Agriculture	5
ENVS 130L	Agroecology and Sustainable Agriculture Laboratory	2
ENVS 130B	Justice and Sustainability in Agriculture	5
ENVS 131	Insect Ecology	5
ENVS 160	Restoration Ecology	5
ENVS 161A	Soils and Plant Nutrition	5
ENVS 162	Plant Physiological Ecology	5
ENVS 163	Plant Disease Ecology	5

Science Communication

SCIC 160	Introduction to Science Writing	5
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Three general electives chosen from the following:

Note: Lecture/lab combinations count as one course.

Biological Sciences-EEB

Any upper-division BIOE course numbered BIOE 100-179 of 5 or more credits

Biological Sciences-MCDB

BIOE 100	Biochemistry	5
BIOE 101	Molecular Biology	5
BIOE 110	Cell Biology	5
BIOE 115	Eukaryotic Molecular Biology	5
BIOE 120	Developmental Biology	5

Earth and Planetary Sciences

EART 100	Vertebrate Paleontology	5
EART 100L	Vertebrate Paleontology Laboratory	2
EART 101	Invertebrate Paleobiology	5
EART 101L	Invertebrate Paleobiology Laboratory	1
EART 102	Marine Geology	5
EART 105	Coastal Geology	5

Economics

ECON 166A	Game Theory and Applications I	5
ECON 166B	Game Theory and Applications II	5

Environmental Studies (enrollment by permission

of instructor)			BIOE 183W	Undergraduate Research in EEB--Writing	2
ENVS 104A	Introduction to Environmental Field Methods	5	BIOE 183L	Undergraduate Research in EEB	3
ENVS 104L	Field Methods Laboratory	2	BIOE 193	Independent Research in EEB	5
ENVS 107A	Natural History Field Quarter	5	BIOE 193F	Independent Research in EEB	2
ENVS 107B	Natural History Field Quarter	5	BIOE 195	Senior Thesis	5
ENVS 107C	Natural History Field Quarter	5	Environmental Studies		
ENVS 108	General Entomology	5	ENVS 183	Environmental Studies Internship	5
ENVS 115A	Geographic Information Systems and Environmental Applications	5	Disciplinary Communication (DC) Requirement		
ENVS 115L	Exercises in Geographic Information Systems	2	Students of every major must satisfy that major's upper-division disciplinary communication (DC) requirement. The DC requirement in plant sciences is satisfied by completing two of the following ecology and evolutionary biology courses:		
ENVS 120	Conservation Biology	5	Note: Lecture and 2-credit lab combinations count as a single course.		
ENVS 122	Tropical Ecology and Conservation	5	BIOE 108	Marine Ecology	5
ENVS 123	Animal Ecology and Conservation	5	BIOE 114	Herpetology	5
ENVS 129	Integrated Pest Management	5	BIOE 114L	Field Methods in Herpetological Research	2
ENVS 130A	Agroecology and Sustainable Agriculture	5	BIOE 117	Systematic Botany of Flowering Plants	5
ENVS 130L	Agroecology and Sustainable Agriculture Laboratory	2	BIOE 120	Marine Botany	5
ENVS 130B	Justice and Sustainability in Agriculture	5	BIOE 120L	Marine Botany Laboratory	2
ENVS 131	Insect Ecology	5	BIOE 122	Invertebrate Zoology	5
ENVS 160	Restoration Ecology	5	BIOE 122L	Invertebrate Zoology Laboratory	2
ENVS 161A	Soils and Plant Nutrition	5	BIOE 127	Ichthyology	5
ENVS 162	Plant Physiological Ecology	5	BIOE 127L	Ichthyology Laboratory	2
ENVS 163	Plant Disease Ecology	5	BIOE 128L	Large Marine Vertebrates Field Course	5
ENVS 167	Freshwater and Wetland Ecology	5	BIOE 129	Biology of Marine Mammals	5
ENVS 168	Biogeochemistry and the Global Environment	5	BIOE 129L	Biology of Marine Mammals Laboratory	2
Microbiology and Environmental Toxicology			BIOE 137	Molecular Ecology	5
METX 119	Microbiology	5	BIOE 141L	Behavioral Ecology Field Course	5
METX 119L	Microbiology Laboratory	5	BIOE 145	Plant Ecology	5
METX 100	Introduction to Microbiology	5	BIOE 145L	Field Methods in Plant Ecology	5
Ocean Sciences			BIOE 150L	Ecological Field Methods Laboratory	5
OCEA 118	Marine Microbial Ecology	5	BIOE 151B	Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory	5
OCEA 130	Biological Oceanography	5	BIOE 153C	Disciplinary Communication for Biologists	5
Psychology			BIOE 158L	Field Methods in Marine Ecology	5
PSYC 123	Cognitive Neuroscience	5	BIOE 159A	Marine Ecology Field Quarter: Marine Ecology with Laboratory	5
One of the following may also be used as an upper-division general elective:					
Biological Sciences-EEB					
Any 5 credits of undergraduate research					

BIOE 161L	Kelp Forest Ecology Laboratory	5
BIOE 171	Disciplinary Communication for Biologists	5
BIOE 172	Population Genetics	5

For 2-credit laboratory courses listed above that are taken concurrently with 5-credit lectures, both courses must be passed to receive one half of the DC requirement. BIOE 117 and BIOE 137 require concurrent enrollment in 2-credit labs, BIOE 117L and BIOE 137L, but these are not part of the DC requirement.

Comprehensive Requirement

All majors in the biological sciences require completion of a comprehensive requirement. This requirement can be satisfied in one of the following ways:

- Receiving a passing grade in an independent research course, or field/laboratory course listed below.
- Completing a senior thesis.
- Achieving a graduate record examination (GRE) score at or above the 50th percentile on the biology subject test or the biochemistry, cell, and molecular biology subject test. Reports of GRE scores must be submitted to the EEB undergraduate advising office before the last day of the graduating quarter.
- Obtaining a medical college admission test (MCAT) score at or above the 50th percentile on the biological sciences section. Reports of MCAT scores must be submitted to the EEB undergraduate advising office before the last day of the graduating quarter.

Comprehensive courses offered by Ecology and Evolutionary Biology

Note: Lab courses may have associated prerequisite or corequisite lecture courses.

BIOE 112L	Ornithology Field Studies	2
BIOE 114L	Field Methods in Herpetological Research	2
BIOE 117L	Systematic Botany of Flowering Plants Laboratory	2
BIOE 120L	Marine Botany Laboratory	2
BIOE 122L	Invertebrate Zoology Laboratory	2
BIOE 124L	Mammalogy Laboratory	2
BIOE 127L	Ichthyology Laboratory	2
BIOE 128L	Large Marine Vertebrates Field Course	5
BIOE 129L	Biology of Marine Mammals Laboratory	2
BIOE 131L	Animal Physiology Laboratory	2
BIOE 133L	Exercise Physiology Laboratory	2

BIOE 134L	Comparative Vertebrate Anatomy Laboratory	2
BIOE 135L	Plant Physiology Laboratory	2
BIOE 137L	Molecular Ecology Laboratory	2
BIOE 141L	Behavioral Ecology Field Course	5
BIOE 142L	Animal Behavior in the Wild (A Virtual Field Course)	5
BIOE 145L	Field Methods in Plant Ecology	5
BIOE 150L	Ecological Field Methods Laboratory	5
BIOE 151A	Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory	5
BIOE 151B	Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory	5
BIOE 151C	Ecology and Conservation in Practice Supercourse: Functions and Processes of Terrestrial Ecosystems	5
BIOE 151D	Ecology and Conservation in Practice Supercourse: Conservation in Practice	4
BIOE 153A	Introduction to Arctic Ecology	5
BIOE 153B	Arctic Ecology	5
BIOE 153C	Disciplinary Communication for Biologists	5
BIOE 155L	Freshwater Ecology Laboratory	5
BIOE 158L	Field Methods in Marine Ecology	5
BIOE 159A	Marine Ecology Field Quarter: Marine Ecology with Laboratory	5
BIOE 159B	Marine Ecology Field Quarter: Ichthyology with Laboratory	5
BIOE 159C	Marine Ecology Field Quarter: Methods in Field Ecology	5
BIOE 159D	Marine Ecology Field Quarter: Methods in Field Ecology Laboratory	5
BIOE 161L	Kelp Forest Ecology Laboratory	5
BIOE 163L	Ecology of Reefs, Mangroves, and Seagrasses Laboratory	2
BIOE 183W	Undergraduate Research in EEB--Writing	2

Comprehensive courses offered by Molecular, Cell and Developmental Biology

BIOL 100L	Biochemistry Laboratory	5
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BIOL 105L	Eukaryotic Genetics Laboratory	5
BIOL 109L	Yeast Molecular Genetics Laboratory	5
BIOL 115L	Eukaryotic Molecular Biology Laboratory	5
BIOL 120L	Development Laboratory	5
BIOL 121L	Environmental Phage Biology Laboratory	5
BIOL 186L	Undergraduate Research in MCD Biology	5
BIOL 186R	Undergraduate Research in MCD Biology	5
BIOL 189	Health Sciences Internship	3

Comprehensive courses offered in other departments

BIOC 110L	Advanced Biochemistry Laboratory	5
METX 119L	Microbiology Laboratory	5
CRSN 152	IDEASS Laboratory Practicum	2

Planners

In addition to the specific courses shown in these planners, a student must complete courses satisfying the IM, TA, PE, PR, CC, ER and C campus general education requirements.

Sample Frosh Planner

1st (frosh)	BIOE 20C	MATH 11A or MATH 19A	MATH 11B or MATH 19B
		CHEM 1A	CHEM 1B
2nd (soph)	BIOL 20A	BIOE 20B	BIOL 105
	CHEM 1C & CHEM 1N	STAT 7 & STAT 7L	PHYS 6A & PHYS 6L
3rd (junior)	BIOE 109	BIOE 107	EEB general elective
	PHYS 6C	*PLNT topical elective	Botany & lab
4th (senior)	EEB general elective	*PLNT topical elective	EEB general elective

Plant physiology *PLNT topical elective

*PLNT = Plant Sciences BS

Electives must be chosen to satisfy the Disciplinary Communication and Comprehensive requirements.

Additional Frosh sample planners may be found on the EEB website.

Sample Transfer Planner

For students who transferred in after completing the transfer screening courses and:

- MATH 11B
- CHEM 1C & CHEM 1N
- PHYS 6A & PHYS 6L, and PHYS 6B or PHYS 6C

	Fall	Winter	Spring
3rd (junior)	BIOL 105	BIOE 107	BIOE 109
	*PLNT topical elective	*PLNT topical elective	*PLNT topical elective
	STAT 7 & STAT 7L		
4th (senior)	EEB general elective	Botany & lab	EEB general elective
	Plant physiology	EEB general elective	

*PLNT = Plant Sciences B.S.

Electives must be chosen to satisfy the Disciplinary Communication and Comprehensive requirements.

Additional sample Transfer student sample planners may be found on the EEB website.

ECOLOGY AND EVOLUTIONARY BIOLOGY BACHELORSMASTERS CONTIGUOUS PATHWAY

The Ecology and Evolutionary Biology (EEB) Department offers a contiguous bachelor's/master's path program, which can be completed with an appropriate bachelor's degree at UC Santa Cruz in five years. The program provides highly motivated undergraduate majors

the opportunity to earn separate bachelor's (B.A.) and master's (M.A.) degrees. This pathway provides an additional level of preparation and experience to help students pursue careers in industry or government, or to increase their competitiveness for doctoral programs.

Students applying to the EEB Contiguous Bachelor's/Master's Path must be UC Santa Cruz undergraduates who are in the process of developing or conducting an independent research project with an EEB ladder rank faculty as their advisor or co-advisor. The undergraduate thesis advisor is the person who recommends applicants to the contiguous B.A./M.A. program and agrees to continue serving as their master's advisor or co-advisor. Students applying to this program will either be completing an undergraduate degree in one of the majors administered by EEB (i.e., biology, ecology and evolutionary biology, marine biology, or plant science) or completing an undergraduate degree in a related field and have completed and done well in the EEB coursework relevant to their proposed research. The master's degree consists of 35 total credits, 15 credits from upper-level undergraduate courses and 20 credits in graduate-level courses.

Applications to the contiguous B.A./M.A. path are completed in a two-step process. In spring of the undergraduate's junior year, they will complete the EEB departmental application form as described in the checklist below. If approved for the additional-year Contiguous Bachelor's/Master's Path, students will go through the regular EEB master's program application process in fall of their senior year. Admission to the program is not guaranteed; significant progress on the thesis research project combined with an excellent academic track record will indicate the preparedness of the student to undertake this accelerated master's program.

Checklist for Bachelor's/Master's Students

1. Read the program information on the Contiguous Bachelor's/Master's Path website, including requirements and deadlines. **Note:** The M.A. is a Plan I Thesis Track master's.
2. To be able to take advantage of this program, by the middle of your **junior year** you will need to find an EEB ladder rank faculty advisor or co-advisor with whom you will design and complete your research project. If you choose to work with an adjunct or affiliated faculty, you must also have a ladder rank faculty as your co-advisor. At this point the research project may develop either into an undergraduate senior thesis project or a master's research project.
3. By spring of the **junior year**, submit your EEB departmental application for consideration to apply to the contiguous B.A./M.A. program. This must include:
 - a. a letter from a ladder rank faculty in EEB who agrees to be your master's advisor or co-advisor;
 - b. a brief description (maximum one page) of your planned research;
 - c. a curricular plan that has been reviewed by your proposed EEB faculty advisor and any other proposed faculty co-advisors, Biology Advising (or the appropriate advising for your undergraduate major at UCSC) and the EEB Graduate Program coordinator to ensure you can complete all coursework required for both degrees in five years.
4. In the fall of your senior year, if your departmental application is approved and you and your advisor still believe the research project could develop into a master's thesis, apply for admission through the UCSC Graduate Division portal to the M.A. Program (due date Dec. 10).
 - a. Your statement of purpose must include a proposed research plan for your master's thesis.
 - b. You must include a letter of recommendation from a ladder rank EEB faculty advisor or co-advisor stating that they approve this plan and agree to serve as your advisor or co-advisor for your master's research and thesis.
5. By the end of senior year, complete all requirements for your bachelor's degree from UCSC and submit an undergraduate thesis, which includes a section on your proposed research extension (for the master's thesis), following the same guidelines as the existing Two-Year Master's Program. This thesis must be read and approved by your EEB ladder rank faculty advisor. Recommendation: enroll in a graduate-level class at some time during your senior year and also attend EEB departmental seminars (BIOE 294). Entry-level graduate classes include BIOE 203, BIOE 215, BIOE 238, BIOE 239, and BIOE 245.
6. During the master's year, complete the graduate course and seminar requirements while working on your master's thesis.
 - a. You will enroll in BIOE 200A, BIOE 200B, BIOE 279, and attend EEB departmental seminars (BIOE 294) every quarter, and enroll in two quarters of BIOE 203 or one of BIOE 203 and one of BIOE 215. A student may take BIOE 203 and BIOE 215 during their senior undergraduate year as long as these courses are not used to meet course and credit requirements for their undergraduate degree. Establish a master's thesis committee consisting of your research advisor (chair) plus two other ladder rank faculty.
7. Master's Thesis/Master's Thesis Defense

- a. At the beginning of your senior undergraduate year, develop a timeline with your adviser that includes deadlines for all components of the thesis; a complete draft should be submitted to your advisor by early April at the latest. There is usually an extensive revising process prior to giving the thesis to the other committee members.
- b. By Friday of week 10 of winter quarter schedule your defense and public seminar with your master's thesis committee members through the departmental graduate coordinator.
- c. One month (30 days) before the thesis defense date (at the latest), email the thesis to your other thesis committee members.
- d. During your defense you will present your work to be reviewed by your committee. They may also ask general knowledge questions to test your mastery of the subject area. Corrections and/or additions to your thesis may be suggested.
- e. Next, a formal, public research seminar will be presented by the student. This seminar should be scheduled with the EEB Graduate Program coordinator for the regular time slot when possible, and may not be scheduled for less than a week after the closed defense meeting. It is important to leave enough time before the public seminar for the student to make changes to the thesis manuscript that are requested by the committee. The M.A. Thesis Reading Committee chair signs the title sheet only after the research has been presented in a public seminar.
- f. Submit the final version of your master's thesis and complete your final appointment with the Graduate Division. In order to participate in the graduation ceremony, students must submit all documentation to the Graduate Division by the deadline as stated in the Academic and Administrative Calendar. This usually occurs during week nine of spring quarter.

If a student completes their UCSC bachelor's degree and is admitted to the Contiguous Bachelor's/Master's Path, but does not successfully complete all requirements expected for this program, then they would revert to the existing EEB Master's Program requirements. They must remain in good standing in the program and follow all existing guidelines of the EEB Master's Program. The baseline assumption is that students admitted to the Contiguous Bachelor's/Master's Path will be self-funded throughout their enrollment in the master's program.

ECOLOGY AND EVOLUTIONARY BIOLOGY

M.A.

Introduction

All curricular requirements are aimed at preparing students for timely and successful completion of a master thesis. The master of arts (M.A.) curriculum in Ecology and Evolutionary Biology (EEB) includes two stages: 1) required coursework, 2) the research, writing, and defense of the master thesis.

Requirements

Course Requirements

M.A. students must take BIOE 200A, BIOE 200B, BIOE 279, and two quarters of BIOE 203 (or one quarter of BIOE 203 and one quarter of BIOE 215 (formerly BIOE 295) within their first two years. BIOE 281, BIOE 294, and BIOE 297 (Independent Study) must be taken every quarter the student is in residence. All students must be enrolled in at least 15 credits per quarter, unless on approved part-time status. No more than 15 credits from upper-division undergraduate courses may be used as part of the student's coursework.

Core Courses

BIOE 200A	Scientific Skills	5
BIOE 200B	Advanced Organismal Biology	5
BIOE 203	Introductory Seminar in Ecology and Evolutionary Biology	3
BIOE 279	Evolutionary Ecology	5

BIOE 203: must be taken twice

BIOE 215 (formerly BIOE 295): may substitute for BIOE 203 once

The following courses must be taken every quarter the student is in residence.

BIOE 281	Graduate Seminar
BIOE 294	Ecology, Evolutionary Biology Seminar
BIOE 297	Independent Study

Elective Courses

BIOE 208	Marine Ecology	5
BIOE 245	Plant Ecology	5
BIOE 245L	Field Methods in Plant Ecology Laboratory	5
BIOE 247	Community Ecology	5
BIOE 239	Mathematical Modeling and Data Science in Ecology and Evolution	5
BIOE 238	Modeling Evolution and Ecology	5
BIOE 258L	Experimental Marine Ecology	5
BIOE 262	Facilitating Change in Coastal Science Policy	5

BIOE 271	Disciplinary Communication for Biologists	5	quarters of BIOE 215 (formerly BIOE 295) or two additional quarters of BIOE 203 should be completed by the end of the second year.
BIOE 272	Population Genetics	5	BIOE 200A Scientific Skills 5
BIOE 286	Experimental Design and Data Analysis	5	BIOE 200B Advanced Organismal Biology 5
BIOE 286L	Experimental Design and Data Analysis Lab	2	BIOE 203 Introductory Seminar in Ecology and Evolutionary Biology 3
BIOE 139	Mathematical Modeling and Data Science in Ecology and Evolution	5	BIOE 279 Evolutionary Ecology 5 BIOE 139 Mathematical Modeling and Data Science in Ecology and Evolution 5

Other Requirements

The master research project is identified by students and requires approval from the students' masters reading committee in the fall of the second year. The master thesis manuscript is submitted to the students' masters reading committee, defended in a closed oral examination, and presented in a departmental seminar by the end of the second year.

Deadlines at each stage must be confirmed with the graduate program coordinator.

Academic Progress

Normative time to degree for the M.A. program is two years. Academic progress is formally reviewed in the spring quarter of each academic year.

Applying for Graduation

Information on applying for graduation may be found on the EEB Graduate Program website. Deadlines should always be confirmed with the graduate program coordinator.

ECOLOGY AND EVOLUTIONARY BIOLOGY PH.D.

Introduction

All curricular requirements are aimed at preparing students for timely and successful completion of a doctoral dissertation. The Ph.D. curriculum in Ecology and Evolutionary Biology (EEB) includes six stages: 1) required coursework, 2) the comprehensive examination, 3) the qualifying examination, 4) two quarters of teaching experience, 5) submission of at least one paper for publication, 6) the research, writing, and defense of the dissertation.

Advancement to Candidacy

Course Requirements

Core Courses

Ph.D. students must take BIOE 200A and BIOE 200B in the fall of the first year, and BIOE 279 in the winter of the first year. Two quarters of BIOE 203 are taken in the winter and spring of the first year. In addition, two

BIOE 215 (formerly BIOE 295): may be substituted with additional BIOE 203

The following courses must be taken every quarter the student is in residence.

All students must be enrolled in at least 15 credits per quarter, unless on approved part-time status.

BIOE 281	Graduate Seminar AND
BIOE 294	Ecology, Evolutionary Biology Seminar AND

Either this course BIOE 297 or this course BIOE 299	Independent Study Thesis Research
--	--

BIOE 297 or BIOE 299 is required, not both. BIOE 297 is taken until the student advances to candidacy. BIOE 299 is taken after the student advances to candidacy.

Elective Courses

BIOE 208	Marine Ecology	5
BIOE 245	Plant Ecology	5
BIOE 245L	Field Methods in Plant Ecology Laboratory	5
BIOE 247	Community Ecology	5
BIOE 239	Mathematical Modeling and Data Science in Ecology and Evolution	5
BIOE 238	Modeling Evolution and Ecology	5
BIOE 258L	Experimental Marine Ecology	5
BIOE 262	Facilitating Change in Coastal Science Policy	5
BIOE 271	Disciplinary Communication for Biologists	5
BIOE 272	Population Genetics	5
BIOE 272L	Population Genetics Laboratory	2

Foreign Language Requirements

Teaching Requirement

Each Ph.D. student should expect to complete at least two quarters as a teaching assistant during their graduate career.

Pre-Qualifying Requirements

The comprehensive examination is completed in the fall of the second year. This is a two-part examination, written and oral, the goal of which is to examine the student's breadth and depth of knowledge of evolution, ecology, organismal biology (including physiology and behavior), and general biology. In both the written and oral examinations, the expected level of knowledge of basic biology ranges from introductory level in fields most removed from the student's focus area to a more substantial and advanced level in fields closer to the student's focus area.

Qualifying Examination

The qualifying examination follows the comprehensive examination and is completed no later than the third year. The goal of this two-part examination is to establish the student's proposed dissertation project. Students submit a dissertation research proposal to their qualifying exam committee and defend it in an oral examination. The proposal should be submitted no less than ten days before the oral defense. The proposal defense must be completed by the spring quarter of the third year and be followed by a departmental seminar on the student's research proposal. Students advance to candidacy after having completed all required coursework, the comprehensive examination, and the qualifying examination.

[Optional Catchall]

Dissertation

Dissertation

Within EEB, a dissertation usually contains three or four chapters that comprise original research, each of which is substantial enough to be published in a scientific journal, plus a short introduction and a conclusion/synthesis. The conclusion synthesizes the results of the dissertation as a whole, reflects on how novel insights come from the whole body of work, and may point the reader toward future research directions.

At least one chapter of the dissertation must be submitted to a refereed journal for publication as a final program requirement before receipt of the Ph.D.

Dissertation Defense

The dissertation is defended in a closed oral examination and then presented in a departmental seminar.

Academic Progress

Normative time to degree is six years, though it is possible to complete the program in less time. Academic progress is formally reviewed in the spring quarter of each academic year.

Applying for Graduation

Information for applying for graduation may be found on the EEB Graduate Program website. Deadlines should always be confirmed with the Graduate Program coordinator.

[Optional Catchall]

ECOLOGY AND EVOLUTIONARY BIOLOGY DESIGNATED EMPHASIS

Introduction

Requirements

To receive a designated emphasis in ecology and evolutionary biology (EEB), graduate students must complete the following requirements in addition to the degree requirements for the doctorate in their home department:

Committee Composition and Departmental Approvals

1. Identify a designated faculty advisor from among the faculty of the EEB department, who commits to serve on the qualifying examination committee and on the Ph.D. dissertation reading committee.
2. Once a designated faculty advisor has been identified, file intent to complete the designated emphasis in EEB with the EEB department graduate program coordinator.

Course Requirements

Students are required to complete at least 20 credits of EEB coursework. Courses taken to fulfill program requirements within the home department will not count toward the designated emphasis program's required coursework.

Take the following EEB core courses (required for all EEB graduate students):

BIOE 200A	Scientific Skills	5
BIOE 200B	Advanced Organismal Biology	5
BIOE 279	Evolutionary Ecology	5

Enroll in the following course and attend all EEB Department seminars for one quarter:

BIOE 294	Ecology, Evolutionary Biology Seminar
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Enroll in the following course corresponding to

their EEB faculty advisor and attend their laboratory group seminars for one quarter:

BIOE 281 Graduate Seminar

Take at least two other EEB graduate courses.

BIOE 208	Marine Ecology	5
BIOE 245	Plant Ecology	5
BIOE 245L	Field Methods in Plant Ecology Laboratory	5
BIOE 247	Community Ecology	5
BIOE 239	Mathematical Modeling and Data Science in Ecology and Evolution	5
BIOE 238	Modeling Evolution and Ecology	5
BIOE 258L	Experimental Marine Ecology	5
BIOE 262	Facilitating Change in Coastal Science Policy	5
BIOE 271	Disciplinary Communication for Biologists	5
BIOE 272	Population Genetics	5
BIOE 286	Experimental Design and Data Analysis	5
BIOE 286L	Experimental Design and Data Analysis Lab	2
BIOE 203	Introductory Seminar in Ecology and Evolutionary Biology	3
BIOE 139	Mathematical Modeling and Data Science in Ecology and Evolution	5

Writing, Research and/or Teaching Requirements

Academic Progress

[Optional Catchall]

Mathematics

4111 McHenry
(831) 459-2969
<https://www.math.ucsc.edu>

PROGRAMS OFFERED

Mathematics B.A. (p. 331)

Mathematics Education B.A. (p. 341)

Mathematics B.S. (p. 337)

Mathematics Minor (p. 345)

Mathematics Contiguous Bachelor's/Master's Pathway (p. 345)

Mathematics M.A. (p. 346)

Mathematics Ph.D. (p. 347)

OTHER PROGRAMS OF

INTEREST

Economics and Mathematics Combined B.A. (p. 589)

UNDERGRADUATE PROGRAM

Mathematics is both a fundamental discipline and an essential tool for students of biology, chemistry, computer engineering, computer science, Earth sciences, economics, electrical engineering, information systems management, physics, and psychology. Researchers in all these areas are constantly developing new ways of applying mathematics to their fields. A strong mathematics background is vital to the advanced study of many disciplines, including the physical and biological sciences, engineering, and the social sciences.

The UC Santa Cruz mathematics program offers a wide variety of undergraduate courses:

- Students interested in studying mathematics are strongly encouraged to take algebra, geometry, and trigonometry before entering the university. Students needing mathematics courses for their intended major are strongly encouraged to consider their options, and take the necessary steps for assessment and placement as early as possible. Progress in some majors could be delayed if the calculus series is not begun upon arrival at UCSC. Students concerned about their ability to place into courses above MATH 3 should consider taking MATH 2 or its equivalent prior to entering UCSC.
- Lower-division courses with numbers in the range MATH 11A through MATH 24 (calculus, linear algebra, vector calculus, and differential equations) prepare students for further study in mathematics, the physical and biological sciences, engineering, or quantitative areas of the social sciences. Science and engineering majors take some or all of these courses as part of their undergraduate studies.
- Upper-division courses, with numbers in the range MATH 100-MATH 199, are intended for majors in mathematics and closely related disciplines. Some of these courses provide students with a solid foundation in key areas of mathematics such as algebra, analysis, geometry, and number theory, whereas others introduce students to more specialized areas of mathematics. Calculus, linear algebra, vector calculus, and proof and problem solving are prerequisite to most of these advanced courses.

All students should review the catalog's requirements for their major or intended major, and possibly consult with the department sponsoring their major (or expected major) before deciding which math courses to take. More information on which courses are intended for the various types of students may be found here at the Mathematics Department website.

Enrollment Requirements

Students who plan to take a mathematics course at UC Santa Cruz must first demonstrate sufficient preparation for that course by completing mathematics placement (see below), the College Entrance Examination Board's Advanced Placement (AP) calculus examination, the International Baccalaureate (IB) Mathematics Examination, or by passing the appropriate prerequisite course.

Through placement, some students may be required to start their UCSC mathematics classes with MATH 2 (followed by MATH 3) or MATH 3 before progressing to one of the calculus series. Students who have passed MATH 2 may enroll in MATH 3. Students who have passed MATH 3 may enroll in course MATH 11A or MATH 19A. Students who have passed a precalculus course at a college or university may enroll in course MATH 11A or MATH 19A, but they must first verify eligibility of the course (on Assist.org) and course completion with the mathematics adviser.

UC Santa Cruz Mathematics Placement

Mathematics placement assesses student readiness for their first UC Santa Cruz mathematics class. Students whose areas of study require precalculus or calculus courses are strongly advised to complete placement, as well as any required courses, early in their academic careers. Students intending to take one or more mathematics courses at UCSC should begin placement as early as possible to fully benefit from the process.

Students completing placement by assessment through ALEKS PPL should familiarize themselves with the instructions and guidelines, course eligibility cut-offs, and score posting schedule.

Advanced Placement (AP) Calculus Examinations

Students completing placement requirements by using their scores on the College Board's Advanced Placement Calculus Exam should refer to this table for course equivalencies.

International Baccalaureate (IB) Examination in Mathematics

Students completing placement requirements by using their scores from the International Baccalaureate Exam should refer to this table for course equivalencies.

GRADUATE PROGRAM

The Mathematics Department offers programs leading to the Master of Arts (M.A.) and Doctor of Philosophy (Ph.D.) degrees. Students admitted to the Ph.D. program may receive a master's degree en route to the Ph.D.; students admitted to the M.A. program may apply to the

department to transfer to the Ph.D. program upon passing the required preliminary examinations at the Ph.D. level.

In order to be prepared for the master's or Ph.D. program, it is recommended to have a B.A. or B.S. in mathematics. Having taken more than the bare minimum of required upper-division classes in the mathematics major will be most helpful.

The Mathematics Department at UC Santa Cruz is small but dynamic, with an ongoing commitment to both research and teaching. The department has leading programs in several actively developing areas on the frontiers of pure and applied mathematics, interacting strongly with theoretical physics and mechanics.

Current areas of research in Algebra: Number Theory Topology, and Vertex Operators include:

- Vertex operator algebras, conformal field theory, modular forms, Hopf algebras, category theory, infinite-dimensional Lie algebras, mathematical physics.
- Representations of Lie and p-adic groups, applications to number theory, Bessel functions, Rankin-Selberg integrals, Gelfand-Graev models.
- Finite groups, their representations and representation rings. Conjectures of Alperin, Broué and Dade. Mackey functors, biset functors, Burnside rings, fusion systems, blocks of group algebras. ring theory, module theory, category theory, homological algebra.
- Algebraic topology, cobordism cohomology theories, elliptic genera and modular forms, string topology of loop spaces, topological quantum field theories.
- Triangulated categories, tensor triangular geometry, stable homotopy theory, and higher category theory.
- Galois and incidence geometry.
- Arithmetic algebraic geometry of moduli spaces and locally symmetric varieties.

Current areas of research in Analysis, Geometry and Dynamics include:

- Symplectic and contact geometry and topology, Floer homology, periodic orbits and dynamics of Hamiltonian systems and Reeb flows.
- Dynamical systems, celestial mechanics, geometric mechanics, bifurcation theory, control theory.
- Geometric integration schemes, numerical methods on manifolds.
- Differential geometry, nonlinear analysis, Ginzburg-Landau problem.

- General relativity, Einstein's equations, positive mass conjecture, Teichmüller theory.
- Geometric Analysis: geometric flows, harmonic maps, minimal surfaces, surfaces of constant mean curvature, min-max theory.
- Functional analysis, spectral theory, and Banach algebras; Toeplitz and Hankel operators, matrices, and determinants; Wiener-Hopf factorization and Riemann-Hilbert problems; applications to random matrix theory and statistical physics.
- Inverse problems in PDEs and integral geometry, X-ray/Radon transforms, non-abelian X-ray transforms, with applications to imaging sciences.
- Spectral Zeta Functions and applications in Quantum Field Theory and Number Theory.

Further information about the research pursued by our faculty can be explored via the links above. Also, see individual faculty websites for more information.

Admission to the Graduate Program

Submit your application through the Graduate Division. The deadline is usually during the first half of January. Admission is decided by a faculty committee, and is based on a combination of factors including: GRE scores (in particular the GRE Math Subject Score), letters of recommendation, GPA, and classes taken.

Financial Support

The Mathematics Department is strongly committed to the financial support of graduate students who are making good progress toward either the master's or the Ph.D. degree. For the purpose of financial support, a student's progress is measured against the degree requirements and timetables.

A teaching assistantship (TA) is the most common form of financial support for graduate students in good academic standing. TA appointments are usually made at 50 percent time (an assigned workload of approximately 220 hours for the quarter). Teaching assistants are under the supervision of the faculty member responsible for the course.

All students are strongly urged to complete a Free Application for Financial Student Aid (FAFSA) each year by the start of fall quarter to determine eligibility for need-based awards. Students are also encouraged to apply for support from the Financial Aid Office as well as from the Mathematics Department.

No need-based fellowship can be awarded to a student who does not have a current FAFSA on file. Students facing special financial hardship are urged to make this known to the department in a timely manner.

The Mathematics Department will do everything in its power to ensure that all students in good standing are

granted sufficient financial aid to continue their study of mathematics.

Relationship of Master's and Doctoral Programs

Students in the master's and doctoral program take the same classes in the core sequences and the same preliminary examinations. Ph.D. and master's students have the same passing requirements in the core classes. However, the preliminary examination requirements for Ph.D. and master's students are different, and are outlined within the requirements section of each program.

MATHEMATICS B.A.

Information and Policies

Introduction

The mathematics bachelor of arts (B.A.) program provides an excellent liberal arts background from which to pursue a variety of career opportunities. UC Santa Cruz graduates with a B.A. in mathematics hold teaching posts at all levels, as well as positions in law, government, civil service, insurance, software development, business, banking, actuarial science, forensics, and other professions where skills in logic, numerical analysis, and computing are required. In particular, students are trained in the art of problem-solving--- an essential skill in all professions.

Within the major, there are two concentrations leading to the Bachelor of Arts in Mathematics: *pure mathematics* and *computational mathematics*.

Pure Mathematics

This pathway emphasizes the importance of a well-rounded, in-depth mathematical education, and includes advanced coursework in algebra, analysis, and geometry. Students often pursue a career with a focus on research and theory.

Computational Mathematics

Students explore ways math can be used to answer questions in many other fields. They gain experience in mathematical modeling of real-world phenomena via ordinary and partial differential equations, approximation and optimization techniques, programming, or game theory.

Both of these concentrations are designed to give students a strong background for graduate study, for work in industry or government, or for teaching. Each concentration requires nine or ten courses, one of which must be a senior thesis or senior seminar. A minor in *pure mathematics* is also offered.

Academic Advising for the Program

The undergraduate advisor may be contacted via email at mathadvising@ucsc.edu. The advisor provides

information about requirements, prerequisites, policies and procedures, learning support, scholarships, and special opportunities for undergraduate research. In addition, the advisor assists with the drafting of study plans, as well as certifying degrees and minors. Students are urged to stay informed and involved with their major, as well as to seek advice should problems arise.

The Mathematics Department website is a critical resource for students. Here you will find a link to the undergraduate program; the materials at that link constitute the undergraduate handbook. Students should visit this first to seek answers to their questions, because it hosts a wealth of information. Each student in the major is encouraged to regularly review the materials posted to stay current with requirements, course curriculum, and departmental policy. Transfer students should consult the Transfer Information and Policy section.

Getting Started in the Major

It should be emphasized that the nature of mathematics changes dramatically between lower-division and upper-division courses. Students often find that the material becomes far more abstract and theoretical. In addition, the role of computation in assignments diminishes and a greater weight is placed on deductive reasoning and the integral role of mathematical proofs. The Mathematics Department recommends that students interested in a mathematics major enroll in MATH 100 as early as prerequisites allow in order to decide whether they are interested in upper-division mathematics courses.

Program Learning Outcomes

Learning outcomes summarize the most important knowledge, skills, abilities and attitudes that students are expected to develop over the course of their studies. The program learning outcomes clearly communicate the faculty's expectations to students, provide a framework for faculty evaluation of the curriculum based on empirical data, and help improve and measure the impact of implemented changes.

Mathematics Undergraduate Student Learning Objectives

The mathematics program promotes mathematical skills and knowledge for their intrinsic beauty, effectiveness in developing proficiency in analytical reasoning, and utility in modeling and solving real world problems. To responsibly live within and participate in the transformation of a rapidly changing, complex, and interdependent society, toward a sustainable and socially just society, students must develop and unceasingly exercise their analytical abilities. Students who have learned to logically question assertions, recognize patterns, and can distinguish the essential from the irrelevant aspects of problems can think deeply and precisely. Students equipped with these skills will be in a position to help solve the "big" problems of our time such as climate change.

Students majoring in mathematics attain proficiency in:

Critical thinking. The ability to identify, reflect upon, evaluate, integrate, and apply different types of information and knowledge to form independent judgments including analytical and logical thinking and the habit of drawing conclusions based on quantitative information.

Problem solving. The ability to assess and interpret complex situations, choose among several potentially appropriate mathematical methods of solution, persist in the face of difficulty, and present full and cogent solutions that include appropriate justification for their reasoning.

Effective communication. The ability to communicate and interact effectively with different audiences, collaborate intellectually and creatively in diverse contexts, and appreciate ambiguity and nuance, while emphasizing the importance of clarity and precision in communication and reasoning.

Students acquire and enhance these abilities in mathematical contexts, but the acquired habits of rigorous thought and creative problem solving are invaluable in all aspects of life. These skills are acquired through experience in the context of studying specific mathematical topics and exploring problems chosen to challenge students' abilities, spurring them on to acquire new techniques and to abandon familiar but restrictive habits of thought. The overarching objectives can be realized in terms of more focused, appraisable objectives specific to mathematics described on the Mathematics Department website.

Curriculum Matrix

All of the key objectives are addressed to some extent in all courses. For example, the ability to formulate precise mathematical statements and to reason logically are essential skills that are progressively developed throughout the curriculum. However, some skills are more heavily emphasized and utilized in some courses than in others. Some courses are specifically intended to help students move to a new level of proficiency with a particular portfolio of skills, while others are accessible only to students who have already reached a given level; the latter courses make heavy use of particular skills, and thus enhance and reinforce the student's mastery of them, but the skills themselves are not the primary focus of such courses. Some connections between the key objectives, main subject-specific areas, and courses are indicated in the tables of lower- and upper-division mathematics courses at the Mathematics Department's website.

Major Qualification Policy and Declaration Process

While enrolled in or after finishing the final required qualification courses a student should follow the directions to apply on the Mathematics Department Major Declaration webpage.

Major Qualification

It is strongly recommended that only students who earn grades of B- or better in MATH 100 consider applying to the major in mathematics.

Admission to the mathematics major (all concentrations) is contingent on students successfully passing the following introductory courses or their equivalents:

Choose one of the following courses:

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 20A	Honors Calculus	5

Plus one of the following courses:

MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 20B	Honors Calculus	5

Plus all of the following courses:

MATH 21	Linear Algebra	5
MATH 23A	Vector Calculus	5
MATH 23B	Vector Calculus	5
MATH 100	Introduction to Proof and Problem Solving	5

Appeal Process

If a student completes major qualification courses but does not meet the major qualification criteria, and appeals, the department may accept or reject the appeal or place conditions on the student that will be resolved within at most one more enrolled quarter. To submit an appeal see the department website for Appealing the Major.

How to Declare a Major

See the Mathematics Department website for directions on How to Qualify for and Petition to Declare a Math Major.

Students should submit a petition to declare as soon as they complete the major qualification requirements or reach their declaration deadline quarter (whichever comes first).

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed major qualification courses.

Transfer Information and Policy

Transfer Admissions Screening Policy

The following courses or their equivalents are required prior to transfer, by the end of the spring term for students planning to enter in the fall.

Students planning to transfer to UC Santa Cruz from a California community college should reference the assist website to determine which courses are equivalent to these required courses.

Prospective students are encouraged to prioritize recommended major preparation, and may additionally complete courses that articulate to UC Santa Cruz general education requirements as time allows.

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 21	Linear Algebra	5
MATH 23A	Vector Calculus	5

Getting Started at UCSC as a Transfer Student

While enrolled in or after finishing the final required qualification courses, a student should follow the directions to apply to declare the major on the Mathematics Department Major Declaration webpage.

To obtain equivalency for MATH 23A, transfer students will have taken a course that may also be equivalent to MATH 23B. Students are encouraged to contact the undergraduate advisor to determine if this applies to their situation.

Letter Grade Policy

There are no restrictions on grading options for Mathematics Department courses. Please see the UCSC-wide policies on grading options.

[Optional Catchall]

Course Substitution Policy

The Mathematics Department's undergraduate vice chair approves requests for course substitutions. See the department website for details on requesting an exception to policy or course substitution.

Honors

Honors in the Mathematics Department are awarded to graduating students whose academic performance in the major demonstrates excellence at a GPA of 3.5 or above. Highest honors are determined by a cumulative review of student performance in mathematics courses. They are awarded to students who excel in challenging courses and in their capstone projects.

Pure Mathematics Concentration

This concentration is intended for students who desire a comprehensive understanding of mathematics.

Course Requirements**Lower-Division Courses****Choose one of the following courses:**

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 20A	Honors Calculus	5

Plus one of the following courses:

MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 20B	Honors Calculus	5

Plus all of the following courses:

MATH 21	Linear Algebra	5
MATH 23A	Vector Calculus	5
MATH 23B	Vector Calculus	5
MATH 24	Ordinary Differential Equations	5

Upper-Division Courses**The following course:**

MATH 100	Introduction to Proof and Problem Solving	5
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Plus one of the following courses:

MATH 103A	Complex Analysis	5
MATH 105A	Real Analysis	5

Plus one of the following courses:

MATH 110	Introduction to Number Theory	5
MATH 111A	Algebra	5
MATH 111T	Algebra	5
MATH 117	Advanced Linear Algebra	5

Plus one of the following courses:

MATH 121A	Differential Geometry	5
MATH 124	Introduction to Topology	5
MATH 128A	Classical Geometry: Euclidean and Non-Euclidean	5
MATH 129	Algebraic Geometry	5

Plus one of the following courses:

MATH 194	Senior Seminar	5
MATH 195	Senior Thesis	5

Electives

The remaining three courses are selected by the student from among any mathematics course numbered above 100 (excluding MATH 188 and MATH 189) and Applied Mathematics (AM) or Statistics (STAT) 100 or above. Only one of the three courses can be from the AM or STAT series.

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement in mathematics is satisfied by

MATH 100	Introduction to Proof and Problem Solving	5
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Plus one of the following courses:

MATH 194	Senior Seminar	5
MATH 195	Senior Thesis	5

Comprehensive Requirement

The comprehensive exit requirement in mathematics is satisfied by one of the following courses:

MATH 194	Senior Seminar	5
MATH 195	Senior Thesis	5

Planners**Pure Mathematics B.A.: Sample Freshmen Academic Plan Starting in Math 19A or 20A**

	Fall	Winter	Spring
1st (frosh)	MATH 19A or MATH 20A	MATH 19B or MATH 20B	MATH 23A
2nd (soph)	MATH 21 MATH 23B	MATH 100	MATH 103A
3rd (junior)	MATH 24	MATH 110	MATH 128A
4th (senior)	Elective	Elective	MATH 194 or MATH 195 Elective

This course plan satisfies the MF general education requirement. Students must satisfy all other general education requirements.

Pure Mathematics B.A.: Sample Freshmen Academic Plan Starting in Math 3

	Fall	Winter	Spring
1st (frosh)	MATH 3	MATH 19A	MATH 19B

2nd (soph)	MATH 21	MATH 23B	MATH 103A
	MATH 23A	MATH 100	
3rd (junior)	MATH 24	MATH 110	MATH 128A
4th (senior)	Elective	Elective	MATH 194 or MATH 195 Elective

This course plan satisfies the MF general education requirement. Students must satisfy all other general education requirements.

Pure Mathematics B.A.: Sample Freshmen Academic Plan Starting in Math 2

	Fall	Winter	Spring
1st (frosh)	MATH 2	MATH 3	MATH 19A
2nd (soph)	MATH 19B	MATH 21	MATH 23B
		MATH 23A	MATH 100
3rd (junior)	MATH 24	MATH 103A	MATH 128A
	MATH 110		
4th (senior)	Elective	Elective	MATH 194 or MATH 195 Elective

This course plan satisfies the MF general education requirement. Students must satisfy all other general education requirements.

Pure Mathematics B.A.: Sample Transfer Academic Plan

For students who have completed MATH 19A, MATH 19B, MATH 21, and MATH 23A equivalents.

	Fall	Winter	Spring
1st (junior)	MATH 23B	MATH 110	MATH 103A
	MATH 100		MATH 128A
2nd (senior)	MATH 24	Elective	MATH 194 or MATH 195
	Elective		Elective

Computational Mathematics Concentration

This concentration is intended to prepare students for technical careers in industry or government while providing a solid mathematical background.

Course Requirements

Lower-Division Courses

Choose one of the following courses:

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 20A	Honors Calculus	5

Plus one of the following courses:

MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 20B	Honors Calculus	5

Plus all of the following courses:

MATH 21	Linear Algebra	5
MATH 23A	Vector Calculus	5
MATH 23B	Vector Calculus	5
MATH 24	Ordinary Differential Equations	5

Upper-Division Courses

All of the following courses:

MATH 100	Introduction to Proof and Problem Solving	5
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Plus one of the following courses:

MATH 103A	Complex Analysis	5
MATH 105A	Real Analysis	5

Plus one of the following courses:

MATH 106	Systems of Ordinary Differential Equations	5
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MATH 107 Partial Differential Equations 5

Plus the following course:

MATH 110 Introduction to Number Theory 5

Plus one of the following courses:

MATH 111A Algebra 5

MATH 111T Algebra 5

MATH 117 Advanced Linear Algebra 5

Plus one of the following options:

MATH 148 Numerical Analysis 5

MATH 145 Introductory Chaos Theory 5

AM 114 Introduction to Dynamical Systems 5

AM 147 Computational Methods and Applications 5

Plus one of the following courses:

MATH 194 Senior Seminar 5

MATH 195 Senior Thesis 5

Electives

Two courses selected from the following:

AM 100 or above

STAT 100 or above

BME 110 Computational Biology Tools 5

CSE 101 Introduction to Data Structures and Algorithms 5

CSE 102 Introduction to Analysis of Algorithms 5

CSE 103 Computational Models 5

CSE 104 Computability and Computational Complexity 5

CSE 106 Applied Graph Theory and Algorithms 5

CSE 107 Probability and Statistics for Engineers 5

CSE 110A Fundamentals of Compiler Design I 5

CSE 111 Advanced Programming 5

CSE 112 Comparative Programming Languages 5

CSE 142 Machine Learning 5

EART 172 Geophysical Fluid Dynamics 5

ECE 103 Signals and Systems 5

ECE 135 Electromagnetic Fields and Waves 5

ECE 130 Introduction to Optoelectronics and Photonics 5

ECE 141 Feedback Control Systems 5

ECE 151 Communications Systems 5

ECE 153 Digital Signal Processing 5

ECON 113 Introduction to Econometrics 5

MATH 115 Graph Theory 5

MATH 116 Combinatorics 5

MATH 120 Coding Theory 5

MATH 134 Cryptography 5

MATH 145 Introductory Chaos Theory 5

MATH 148 Numerical Analysis 5

MATH 152 Programming for Mathematics 5

MATH 160 Mathematical Logic I 5

PHYS 115 Computational Physics 5

Some of these courses have prerequisites within their departments.

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement in mathematics is satisfied by

MATH 100 Introduction to Proof and Problem Solving 5

Plus one of the following courses:

MATH 194 Senior Seminar 5

MATH 195 Senior Thesis 5

Comprehensive Requirement

The comprehensive exit requirement in mathematics is satisfied by one of the following courses:

MATH 194 Senior Seminar 5

MATH 195 Senior Thesis 5

Planners

Computational Mathematics B.A.: Sample Freshmen Academic Plan Starting in Math 19A or 20A

	Fall	Winter	Spring
1st (frosh)	MATH 19A or MATH 20A	MATH 19B or MATH 20B	MATH 21
2nd (soph)	MATH 23B MATH 100	MATH 110	Elective
3rd (junior)	MATH 24	MATH 106	MATH 148
4th (senior)	MATH 111A or	MATH 103A or MATH	MATH 194 or MATH

MATH 117 105A 195
 Elective

This course plan satisfies the MF general education requirement. Students must satisfy all other general education requirements.

Computational Mathematics B.A.: Sample Freshmen Academic Plan Starting in Math 3

	Fall	Winter	Spring
1st (frosh)	MATH 3	MATH 19A	MATH 19B
2nd (soph)	MATH 21 MATH 23A	MATH 23B MATH 100	Elective
3rd (junior)	MATH 24 MATH 110	MATH 106	MATH 148
4th (senior)	MATH 111A or MATH 117	MATH 103A or MATH 105A	MATH 194 or MATH 195 Elective

This course plan satisfies the MF general education requirement. Students must satisfy all other general education requirements.

Computational Mathematics B.A.: Sample Freshmen Academic Plan Starting in Math 2

	Fall	Winter	Spring
1st (frosh)	MATH 2	MATH 3	MATH 19A
2nd (soph)	MATH 19B	MATH 21 MATH 23A	MATH 23B MATH 100

3rd (junior) MATH 24 MATH 106 Elective
 MATH 110 MATH 148/L

4th (senior) MATH 111A
or
MATH 117 MATH 103A
or MATH 105A MATH 194
or MATH 195

Elective

This course plan satisfies the MF general education requirement. Students must satisfy all other general education requirements.

Computational Mathematics B.A.: Sample Transfer Academic Plan

For students who have completed MATH 19A, MATH 19B, MATH 21 and MATH 23A equivalents.

	Fall	Winter	Spring
1st (junior)	MATH 23B	MATH 103A or MATH 105A	MATH 145 & MATH 145L or MATH 148 & MATH 148L
2nd (senior)	MATH 100	MATH 110	MATH 194 or MATH 195
	MATH 111A or MATH 117	Elective	Elective

MATHEMATICS B.S.

Information and Policies

Introduction

The Mathematics Bachelor of Science degree (B.S.) is designed for students who value the theoretical study of mathematics-- not only for application, but also for its own sake. Theoretical mathematicians focus on the big how and why questions of mathematics, and attempt to

find new formulae and methods while utilizing insights from a tradition of thousands of years. The Mathematics B.S. is recommended for those students who seek an education that involves not only foundational computational skills but also rigorous explanations of how mathematics works. A well-rounded education in mathematics requires an introduction to proof class, and a balance of advanced coursework in algebra, analysis, and geometry. Majors who seek graduate study at top institutions often go beyond the required courses to enroll in graduate courses as well.

Academic Advising for the Program

The undergraduate adviser may be contacted via email at mathadvising@ucsc.edu. The adviser provides information about requirements, prerequisites, policies and procedures, learning support, scholarships, and special opportunities for undergraduate research. In addition, the adviser assists with the drafting of study plans, as well as certifying degrees and minors. Students are urged to stay informed and involved with their major, as well as to seek advice should problems arise.

The Mathematics Department website is a critical resource for students. Here you will find a link to the undergraduate program; the materials at that link constitute the undergraduate handbook. Students should visit this first to seek answers to their questions, because it hosts a wealth of information. Each student in the major is encouraged to regularly review the materials posted to stay current with requirements, course curriculum, and departmental policy. Transfer students should consult the Transfer Information and Policy section.

Getting Started in the Major

It should be emphasized that the nature of mathematics changes dramatically between lower-division and upper-division courses. Students often find that the material becomes far more abstract and theoretical. In addition, the role of computation in assignments diminishes and a greater weight is placed on deductive reasoning and the integral role of mathematical proofs. The Mathematics Department recommends that students interested in a mathematics major enroll in MATH 100 as early as prerequisites allow in order to decide whether they are interested in upper-division mathematics courses.

Program Learning Outcomes

Learning outcomes summarize the most important knowledge, skills, abilities and attitudes that students are expected to develop over the course of their studies. The program learning outcomes clearly communicate the faculty's expectations to students, provide a framework for faculty evaluation of the curriculum based on empirical data, and help improve and measure the impact of implemented changes.

Mathematics Undergraduate Student Learning Objectives

The mathematics program promotes mathematical skills and knowledge for their intrinsic beauty, effectiveness in developing proficiency in analytical reasoning, and utility in modeling and solving real-world problems. To responsibly live within and participate in the transformation of a rapidly changing, complex, and interdependent society, toward a sustainable and socially just society, students must develop and unceasingly exercise their analytical abilities. Students who have learned to logically question assertions, recognize patterns, and can distinguish the essential from the irrelevant aspects of problems can think deeply and precisely. Students equipped with these skills will be in a position to help solve the "big" problems of our time such as climate change.

Students majoring in mathematics attain proficiency in:

Critical thinking. The ability to identify, reflect upon, evaluate, integrate, and apply different types of information and knowledge to form independent judgments including analytical and logical thinking and the habit of drawing conclusions based on quantitative information.

Problem solving. The ability to assess and interpret complex situations, choose among several potentially appropriate mathematical methods of solution, persist in the face of difficulty, and present full and cogent solutions that include appropriate justification for their reasoning.

Effective communication. The ability to communicate and interact effectively with different audiences, collaborate intellectually and creatively in diverse contexts, and appreciate ambiguity and nuance, while emphasizing the importance of clarity and precision in communication and reasoning.

Students acquire and enhance these abilities in mathematical contexts, but the acquired habits of rigorous thought and creative problem solving are invaluable in all aspects of life. These skills are acquired through experience in the context of studying specific mathematical topics and exploring problems chosen to challenge students' abilities, spurring them on to acquire new techniques and to abandon familiar but restrictive habits of thought. The overarching objectives can be realized in terms of more focused, appraisable objectives specific to mathematics described on the Mathematics Department website.

Curriculum Matrix

All of the key objectives are addressed to some extent in all courses. For example, the ability to formulate precise mathematical statements and to reason logically are essential skills that are progressively developed throughout the curriculum. However, some skills are more heavily emphasized and utilized in some courses than in others. Some courses are specifically intended to help students move to a new level of proficiency with a particular portfolio of skills, while others are accessible only to students who have already reached a given level;

the latter courses make heavy use of particular skills, and thus enhance and reinforce the student's mastery of them, but the skills themselves are not the primary focus of such courses. Some connections between the key objectives, main subject-specific areas, and courses are indicated in the tables of lower- and upper-division mathematics courses at the Mathematics Department's website.

Major Qualification Policy and Declaration Process

While enrolled in or after finishing the final required qualification courses a student should follow the directions to apply on the Mathematics Department Major Declaration webpage.

Major Qualification

Admission to the Mathematics B.S. major is contingent on students successfully passing the following introductory courses or their equivalents:

Choose one of the following courses:

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 20A	Honors Calculus	5

Plus one of the following courses:

MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 20B	Honors Calculus	5

Plus all of the following courses:

MATH 21	Linear Algebra	5
MATH 23A	Vector Calculus	5
MATH 23B	Vector Calculus	5
MATH 100	Introduction to Proof and Problem Solving	5

Appeal Process

If a student completes major qualification courses but does not meet the major qualification criteria, and appeals, the department may accept or reject the appeal or place conditions on the student that will be resolved within at most one more enrolled quarter. To submit an appeal see the department website for Appealing the Major.

How to Declare a Major

See the Mathematics Department website for directions on How to Qualify for and Petition to Declare a Math Major.

Students should submit a petition to declare as soon as they complete the major qualification requirements or reach their declaration deadline quarter (whichever comes first).

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved,

denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed major qualification courses.

Transfer Information and Policy

Transfer Admission Screening Policy

The following courses or their equivalents are required prior to transfer, by the end of the spring term for students planning to enter in the fall.

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 21	Linear Algebra	5
MATH 23A	Vector Calculus	5

Students planning to transfer to UCSC from a California community college should reference the assist website to determine which courses are equivalent to these required courses.

Recommended Course for Transfer Students

In addition, the following course is recommended prior to transfer to ensure timely graduation.

MATH 24	Ordinary Differential Equations	5
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Getting Started at UCSC as a Transfer Student

While enrolled in or after finishing the final required qualification courses, a student should follow the directions to apply to declare the major on the Mathematics Department Major Declaration webpage.

To obtain equivalency for MATH 23A, transfer students will have taken a course that may also be equivalent to MATH 23B. Students are encouraged to contact the undergraduate adviser to determine if this applies to their situation.

Letter Grade Policy

There are no restrictions on grading options for Mathematics Department courses. Please see the UCSC-wide policies on grading options.

Course Substitution Policy

The Mathematics Department undergraduate vice chair approves requests for course substitutions. See the department website for details on requesting an exception to policy or course substitution.

Honors

Honors in the Mathematics Department are awarded to graduating students whose academic performance in the major demonstrates excellence at a GPA of 3.5 or above. Highest Honors are determined by a cumulative review of student performance in mathematics courses. They are

awarded to students who excel in challenging courses and in their capstone projects.

Requirements and Planners

The Mathematics B.S. major is intended for students who desire a comprehensive understanding of mathematics, including those considering graduate studies in the physical sciences.

Course Requirements

Lower-Division Courses

Choose one of the following courses:

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 20A	Honors Calculus	5

Plus one of the following courses:

MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 20B	Honors Calculus	5

Plus all of the following courses:

MATH 21	Linear Algebra	5
MATH 23A	Vector Calculus	5
MATH 23B	Vector Calculus	5
MATH 24	Ordinary Differential Equations	5

Upper-Division Courses

All of the following courses:

MATH 100	Introduction to Proof and Problem Solving	5
MATH 103A	Complex Analysis	5
MATH 105A	Real Analysis	5
MATH 117	Advanced Linear Algebra	5

Plus one of the following courses:

MATH 111A	Algebra	5
MATH 111T	Algebra	5

Plus one of the following courses:

MATH 121A	Differential Geometry	5
MATH 124	Introduction to Topology	5
MATH 128A	Classical Geometry: Euclidean and Non-Euclidean	5
MATH 129	Algebraic Geometry	5

Plus one of the following courses:

MATH 194	Senior Seminar	5
MATH 195	Senior Thesis	5

Electives

The remaining three courses are selected by the student from among any mathematics course numbered above

100 (excluding MATH 188 and MATH 189) and Applied Mathematics (AM) or Statistics (STAT) 100 or above. Only one of the three courses can be from the AM or STAT series.

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement in the mathematics B.S. is satisfied by

MATH 100	Introduction to Proof and Problem Solving	5
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Plus one of the following courses:

MATH 194	Senior Seminar	5
MATH 195	Senior Thesis	5

Comprehensive Requirement

The comprehensive exit requirement in mathematics is satisfied by one of the following courses:

MATH 194	Senior Seminar	5
MATH 195	Senior Thesis	5

Planners

Mathematics B.S.: Sample Freshmen Academic Plan Starting in MATH 19A

	Fall	Winter	Spring
1st (frosh)	MATH 19A or MATH 20A	MATH 19B or MATH 20B	MATH 21 MATH 23A
2nd (soph)	MATH 23B	MATH 24 MATH 100	MATH 103A
3rd (jr)	Elective	MATH 105A MATH 121A	Elective
4th (sr)	MATH 117	MATH 111A	MATH 194 or MATH 195 Elective

This sample course plan satisfies the MF general education requirement. Students must satisfy all other general education requirements.

128A

Mathematics B.S.: Sample Freshmen Academic Plan Starting in MATH 3

	Fall	Winter	Spring
1st (frosh)	MATH 3	MATH 19A	MATH 19B
2nd (soph)	MATH 21 MATH 23A	MATH 23B MATH 100	MATH 103A
3rd (jr)	Math 24 Math 124	Math 105A Elective	Elective
4th (sr)	MATH 117 Elective	MATH 111A	MATH 194 or MATH 195

4th (sr)	MATH 105A Elective	MATH 111A	MATH 194 or MATH 195 Math 117
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This sample course plan satisfies the MF general education requirement. Students must satisfy all other general education requirements.

Mathematics B.S.: Sample Transfer Academic Plan

For students who have completed MATH 19A, MATH 19B, MATH 21, and MATH 23A equivalents.

	Fall	Winter	Spring
1st (jr)	MATH 23B MATH 100	MATH 103A Elective	MATH 128A Elective
2nd (sr)	MATH 24 MATH 111A	MATH 105A Elective	MATH 194 or MATH 195 MATH 117

This sample course plan satisfies the MF general education requirement. Students must satisfy all other general education requirements.

Mathematics B.S.: Sample Freshmen Academic Plan Starting in MATH 2

	Fall	Winter	Spring
1st (frosh)	MATH 2	MATH 3	MATH 19A
2nd (soph)	MATH 19B	MATH 21 MATH 23A	MATH 23B Math 100
3rd (jr)	MATH 24 Elective	MATH 103A	Elective MATH

MATHEMATICS EDUCATION B.A.

Information and Policies

Introduction

The Mathematics Education Bachelor's of Arts (B.A.) is specially designed to prepare students for a career in K-12 mathematics education. It shares a rigorous approach to advanced mathematics, but requires coursework that is particularly relevant to the K-12 classroom: number theory, classical geometry, and the history of mathematics. In addition, the math education major requires experience in supervised teaching. Many math education majors also participate in CalTeach, to enhance their experience and directly connect with local schools.

In California, students seeking a single-subject credential for secondary teaching in mathematics are required to take the CSET (formerly The National Teachers Examination), a series of examinations that must be passed in order to enter a teaching-credential program. Students who are interested in teaching in high schools can obtain a waiver of the CSET Examinations by completing the mathematics education major, plus three additional specified courses. The Mathematics

Department undergraduate advisor, the Mathematics Department's website, and the Education Department advising office have more information about the additional required course.

Academic Advising for the Program

The undergraduate advisor may be contacted via email at mathadvising@ucsc.edu. The advisor provides information about requirements, prerequisites, policies and procedures, learning support, scholarships, and special opportunities for undergraduate research. In addition, the advisor assists with the drafting of study plans, as well as certifying degrees and minors. Students are urged to stay informed and involved with their major, as well as to seek advice should problems arise.

The Mathematics Department website is a critical resource for students. Here you will find a link to the undergraduate program; the materials at that link constitute the undergraduate handbook. Students should visit this first to seek answers to their questions, because it hosts a wealth of information. Each student in the major is encouraged to regularly review the materials posted to stay current with requirements, course curriculum, and departmental policy. Transfer students should consult the Transfer Information and Policy section.

Getting Started in the Major

It should be emphasized that the nature of mathematics changes dramatically between lower-division and upper-division courses. Students often find that the material becomes far more abstract and theoretical. In addition, the role of computation in assignments diminishes and a greater weight is placed on deductive reasoning and the integral role of mathematical proofs. The Mathematics Department recommends that students interested in a mathematics major enroll in MATH 100 as early as prerequisites allow in order to decide whether they are interested in upper-division mathematics courses.

Program Learning Outcomes

Mathematics Undergraduate Student Learning Objectives

The mathematics program promotes mathematical skills and knowledge for their intrinsic beauty, effectiveness in developing proficiency in analytical reasoning, and utility in modeling and solving real-world problems. To responsibly live within and participate in the transformation of a rapidly changing, complex, and interdependent society, toward a sustainable and socially just society, students must develop and unceasingly exercise their analytical abilities. Students who have learned to logically question assertions, recognize patterns, and can distinguish the essential from the irrelevant aspects of problems can think deeply and precisely. Students equipped with these skills will be in a position to help solve the "big" problems of our time such as climate change.

Students majoring in mathematics attain proficiency in:

Critical thinking. The ability to identify, reflect upon, evaluate, integrate, and apply different types of information and knowledge to form independent judgments including analytical and logical thinking and the habit of drawing conclusions based on quantitative information.

Problem solving. The ability to assess and interpret complex situations, choose among several potentially appropriate mathematical methods of solution, persist in the face of difficulty, and present full and cogent solutions that include appropriate justification for their reasoning.

Effective communication. The ability to communicate and interact effectively with different audiences, collaborate intellectually and creatively in diverse contexts, and appreciate ambiguity and nuance, while emphasizing the importance of clarity and precision in communication and reasoning.

Students acquire and enhance these abilities in mathematical contexts, but the acquired habits of rigorous thought and creative problem solving are invaluable in all aspects of life. These skills are acquired through experience in the context of studying specific mathematical topics and exploring problems chosen to challenge students' abilities, spurring them on to acquire new techniques and to abandon familiar but restrictive habits of thought. The overarching objectives can be realized in terms of more focused, appraisable objectives specific to mathematics described on the Mathematics Department website.

Curriculum Matrix

All of the key objectives are addressed to some extent in all courses. For example, the ability to formulate precise mathematical statements and to reason logically are essential skills that are progressively developed throughout the curriculum. However, some skills are more heavily emphasized and utilized in some courses than in others. Some courses are specifically intended to help students move to a new level of proficiency with a particular portfolio of skills, while others are accessible only to students who have already reached a given level; the latter courses make heavy use of particular skills, and thus enhance and reinforce the student's mastery of them, but the skills themselves are not the primary focus of such courses. Some connections between the key objectives, main subject-specific areas, and courses are indicated in the tables of lower- and upper-division mathematics courses at the Mathematics Department's website.

Major Qualification Policy and Declaration Process

Major Qualification

Admission to the mathematics education major is contingent on students successfully passing the following introductory courses or their equivalents:

Choose one of the following courses:

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 20A	Honors Calculus	5

Plus one of the following courses:

MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 20B	Honors Calculus	5

Plus all of the following courses:

MATH 21	Linear Algebra	5
MATH 23A	Vector Calculus	5
MATH 23B	Vector Calculus	5
MATH 100	Introduction to Proof and Problem Solving	5

Appeal Process

If a student completes major qualification courses but does not meet the major qualification criteria, and appeals, the department may accept or reject the appeal or place conditions on the student that will be resolved within at most one more enrolled quarter. To submit an appeal see the department website for Appealing the Major.

How to Declare a Major

See the Mathematics Department website for directions on How to Qualify for and Petition to Declare a Math Major.

Students should submit a petition to declare as soon as they complete the major qualification requirements or reach their declaration deadline quarter (whichever comes first).

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed major qualification courses.

Transfer Information and Policy**Transfer Admission Screening Policy**

The following courses or their equivalents are required prior to transfer, by the end of the spring term for students planning to enter in the fall.

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 21	Linear Algebra	5
MATH 23A	Vector Calculus	5

Recommended Course for Transfer Students

In addition, the following course is recommended prior to transfer to ensure timely graduation.

STAT 5	Statistics	5
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Getting Started at UCSC as a Transfer Student

While enrolled in or after finishing the final required qualification courses, a student should follow the directions to apply to declare the major on the Mathematics Department Major Declaration webpage.

To obtain equivalency for MATH 23A, transfer students will have taken a course that may also be equivalent to MATH 23B. Students are encouraged to contact the undergraduate advisor to determine if this applies to their situation.

Letter Grade Policy

There are no restrictions on grading options for Mathematics Department courses. Please see the UCSC-wide policies on grading options.

Course Substitution Policy

The Mathematics Department's undergraduate vice chair approves requests for course substitutions. See the department website for details on requesting an exception to policy or course substitution.

Honors

Honors in the Mathematics Department are awarded to graduating students whose academic performance in the major demonstrates excellence at a GPA of 3.5 or above. Highest Honors are determined by a cumulative review of student performance in mathematics courses. They are awarded to students who excel in challenging courses and in their capstone projects.

Requirements and Planners

The Mathematics Education B.A. is intended to introduce students to the mathematics necessary for a career teaching kindergarten through high school (K-12) mathematics.

Course Requirements**Lower-Division Courses****One of the following courses:**

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 20A	Honors Calculus	5

Plus one of the following courses:

MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 20B	Honors Calculus	5

Plus all of the following courses:

MATH 21	Linear Algebra	5
MATH 23A	Vector Calculus	5
MATH 23B	Vector Calculus	5
STAT 5	Statistics	5

(frosh)

19A	19B
or MATH	or MATH
20A	20B

MATH
23A

Upper-Division Courses

All of the following courses:

MATH 100	Introduction to Proof and Problem Solving	5
MATH 110	Introduction to Number Theory	5
MATH 128A	Classical Geometry: Euclidean and Non-Euclidean	5
MATH 181	History of Mathematics	5
STAT 131	Introduction to Probability Theory	5

2nd (soph)

MATH 21	MATH 100	MATH 128A
MATH 23B		

3rd (jr)

MATH 110	MATH 181	MATH 111T
EDUC 50B	EDUC 100B	

Plus one of the following courses:

MATH 103A	Complex Analysis	5
MATH 105A	Real Analysis	5

4th (sr)

STAT 131	MATH 103A or MATH 105A	MATH 194
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Plus one of the following courses:

MATH 111A	Algebra	5
MATH 111T	Algebra	5

Plus all the following courses:

EDUC 50B	CAL Teach 1: Mathematics	2
EDUC 100B	Cal Teach 2: Mathematics	2

The MF, PR, SR and TA general education requirements are satisfied through this sample plan.

Plus one of the following courses:

MATH 194	Senior Seminar	5
MATH 195	Senior Thesis	5

Mathematics Education B.A.: Sample Freshmen Academic Plan Starting in MATH 3

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement in the Mathematics Education B.A. is satisfied by:

MATH 100	Introduction to Proof and Problem Solving	5
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	Fall	Winter	Spring
1st (frosh)	MATH 3	MATH 19A	STAT 5 MATH 19B

Plus one of the following courses:

MATH 194	Senior Seminar	5
MATH 195	Senior Thesis	5

2nd (soph)	MATH 21	MATH 23B	MATH 128A
	MATH 23A	MATH 100	

Comprehensive Requirement

The comprehensive exit requirement in mathematics is satisfied by one of the following courses:

MATH 194	Senior Seminar	5
MATH 195	Senior Thesis	5

3rd (jr)	MATH 110	MATH 181	MATH 111T
	EDUC 50B	EDUC 100B	

Planners

Mathematics Education B.A.: Sample Freshmen Academic Plan Starting in MATH 19A or MATH 20A

	Fall	Winter	Spring
1st	MATH	MATH	STAT 5

4th (sr)	STAT 131	MATH 103A or MATH 105A	MATH 194
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The MF, PR, SR and TA general education requirements are satisfied through this sample plan.

Mathematics Education B.A.: Sample Freshmen Academic Plan Starting in MATH 2

	Fall	Winter	Spring
1st (frosh)	MATH 2	MATH 3	MATH 19A STAT 5
2nd (soph)	MATH 19B	MATH 21 MATH 23A	MATH 23B MATH 100
3rd (jr)	MATH 110 EDUC 50B	MATH 181 EDUC 100B	MATH 111T MATH 128A
4th (sr)	STAT 131	MATH 103A or MATH 105A	MATH 194

The MF, PR, SR and TA general education requirements are satisfied through this sample plan.

Mathematics Education B.A.: Sample Transfer Academic Plan

For students who have completed MATH 19A, MATH 19B, MATH 21 and MATH 23A equivalents.

	Fall	Winter	Spring
1st (jr)	MATH 23B	MATH 103A or MATH 105A	MATH 128A
	MATH 100	MATH 181	STAT 5
2nd (sr)	MATH 110 EDUC 50B	STAT 131 EDUC 100B	MATH 194 MATH 111T

MATHEMATICS MINOR

Course Requirements

The minor is intended for students who are interested in mathematics and want a strong mathematical foundation for studying in areas that rely heavily on analytical skills. Students are required to complete at least 10 courses as follows:

Lower-Division Courses

Choose one of the following courses:

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 20A	Honors Calculus	5

Plus one of the following courses:

MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 20B	Honors Calculus	5

Plus all of the following courses:

MATH 21	Linear Algebra	5
MATH 23A	Vector Calculus	5
MATH 23B	Vector Calculus	5

Upper-Division Courses

MATH 100	Introduction to Proof and Problem Solving	5
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The remaining four courses are selected by the student from among any mathematics course numbered above MATH 100 (excluding MATH 188 and MATH 189), any Applied Mathematics (AM) or Statistics (STAT) course numbered AM 100 or STAT 100 or above, or, subject to approval of the undergraduate vice chair, a course from another department. Only one of the four courses can be from the AM or STAT series or another outside department. Under exceptional circumstances, MATH 100 may be substituted by another upper-division mathematics course. The undergraduate vice chair will review requests on an individual basis.

No senior seminar or thesis is required.

MATHEMATICS CONTIGUOUS BACHELORSMASTERS PATHWAY

The 4+1 pathway into the mathematics master's program is an option that allows undergraduates at UC Santa Cruz to:

- Take two required graduate courses during their undergraduate degree in preparation to finish the master's degree in just one additional year.
- Apply to the mathematics master's program through a streamlined application process.

Undergraduate students currently enrolled in the mathematics B.S. have the opportunity, any time after the start of their junior year until December 1st of their senior year, to apply to be admitted to the 4+1 contiguous pathway leading to the mathematics master's degree. Qualified undergraduates from other undergraduate majors may also apply to the pathway and their applications will be considered on a case-by-case basis.

The requirements for admission into the 4+1 pathway are:

1. a GPA in the major of 3.5 or more;
2. to have taken MATH 105B or MATH 111B; and
3. to have taken, to be currently enrolled, or have the plan to enroll by fall of the senior year in one of the required graduate courses.

Interested students should set up a meeting with the mathematics undergraduate advisor to discuss their curriculum plan and complete the application forms. The deadline for application to the pathway is December 1st of their senior year, although students are encouraged to apply earlier.

Students in the pathway who apply through the streamlined application process to the master's program are not guaranteed admission. The Mathematics Department expects to admit students who have passed two of the required graduate courses and have maintained a GPA in the major of 3.5 or more. Once accepted into the master's program, students from the pathway will follow the same requirements as any other students in the two-year track with expected graduation in the fifth year.

MATHEMATICS M.A.

Introduction

The objectives of the mathematics M.A. program give students advanced fundamental knowledge in the areas of algebra, analysis, and geometry in order to prepare them for admission in top Ph.D. programs, for work in industry, or for a teaching career at community colleges. Students will possess the ability to solve problems and communicate solutions and concepts clearly and in rigorous mathematical language.

Master's students are expected to complete their degree within two years. Students admitted to the M.A. program may apply to the Mathematics Department to transfer to the Ph.D. program upon passing the required preliminary examinations at the Ph.D. level.

Requirements

Course Requirements

The following course:

MATH Pedagogy of Mathematics 2
288A

Students are required to complete four of the

following courses from the three core sequences:

MATH 200	Algebra I	5
MATH 201	Algebra II	5
MATH 202	Algebra III	5
MATH 204	Analysis I	5
MATH 205	Analysis II	5
MATH 206	Analysis III	5
MATH 208	Manifolds I	5
MATH 209	Manifolds II	5
MATH 210	Manifolds III	5

Students are also required to complete five additional courses in mathematics

Courses in a related subject may be substituted by approval from the graduate vice chair. Sample courses include:

MATH 203	Algebra IV	5
MATH 207	Complex Analysis	5
MATH 211	Algebraic Topology	5
MATH 212	Differential Geometry	5
MATH 213A	Partial Differential Equations I	5
MATH 213B	Partial Differential Equations II	5
MATH 214	Theory of Finite Groups	5
MATH 215	Operator Theory	5
MATH 216	Advanced Analysis	5
MATH 217	Advanced Elliptic Partial Differential Equations	5
MATH 218	Advanced Parabolic and Hyperbolic Partial Differential Equations	5
MATH 219	Nonlinear Functional Analysis	5
MATH 220A	Representation Theory I	5
MATH 220B	Representation Theory II	5
MATH 222A	Algebraic Number Theory	5
MATH 222B	Algebraic Number Theory	5
MATH 223A	Algebraic Geometry I	5
MATH 223B	Algebraic Geometry II	5
MATH 225A	Lie Algebras	5
MATH 225B	Infinite Dimensional Lie Algebras	5
MATH 226A	Infinite Dimensional Lie Algebras and Quantum Field Theory I	5
MATH 226B	Infinite Dimensional Lie Algebras and Quantum Field Theory II	5
MATH 227	Lie Groups	5
MATH 228	Lie Incidence Geometries	5
MATH 229	Kac-Moody Algebras	5
MATH 232	Morse Theory	5
MATH 233	Random Matrix Theory	5

MATH 234	Riemann Surfaces	5
MATH 235	Dynamical Systems Theory	5
MATH 238	Elliptic Functions and Modular Forms	5
MATH 239	Homological Algebra	5
MATH 240A	Representations of Finite Groups I	5
MATH 240B	Representations of Finite Groups II	5
MATH 246	Representations of Algebras	5
MATH 248	Symplectic Geometry	5
MATH 249A	Mechanics I	5
MATH 249B	Mechanics II	5
MATH 249C	Mechanics III	5
MATH 252	Fluid Mechanics	5
MATH 254	Geometric Analysis	5
MATH 256	Algebraic Curves	5
MATH 260	Combinatorics	5
MATH 280	Topics in Analysis	5
MATH 281	Topics in Algebra	5
MATH 282	Topics in Geometry	5
MATH 283	Topics in Combinatorial Theory	5
MATH 284	Topics in Dynamics	5
MATH 285	Topics in Partial Differential Equations	5
MATH 286	Topics in Number Theory	5
MATH 287	Topics in Topology	5

Other Requirements

Additional requirements for the M.A. degree are dependent on the student's chosen track: the thesis track or the comprehensive examination track.

Thesis Track

Students are required to complete a master's thesis. A master's thesis does not have to consist of original research results. At the minimum, it should show mastery of a specific subject area that goes beyond the knowledge taught in the core sequences in algebra, analysis, or geometry. This track is recommended for students that want to transfer into a top Ph.D. program.

The student, in consultation with the graduate vice chair, is responsible for selecting a master's thesis reading committee. The majority of the membership of a thesis reading committee shall be members of the Santa Cruz Division of the Academic Senate. The Graduate Division must approve the committee.

The Nominations for Master's Thesis Reading Committee Form must be completed and submitted by the end of the second week of the quarter in which the degree will be granted. The form can be found on the Graduate Division website or can be provided by the Mathematics Department. The form should be turned in to the graduate

adviser and program coordinator for review and submission to the Graduate Division.

More information about thesis submission can be found at the Graduate Division website.

Comprehensive Examination Track

Students are required to obtain a second-level pass on one of three written preliminary examinations: algebra, analysis, or geometry. A second-level pass signifies that the student has a very good understanding of the basic concepts, but not necessarily enough to conduct independent research.

[Optional Catchall]

Applying for Graduation

M.A. students must complete the Application for the Master's Degree form by the appropriate quarter's deadline listed in the current academic calendar.

The application can be found on the Graduate Division website or can be provided by the Mathematics Department. The application should be turned in to the graduate adviser and program coordinator for review and submission to the Graduate Division.

MATHEMATICS PH.D.

Introduction

The objectives of the mathematics Ph.D. program are to prepare students for a career in academia, industry, or teaching. At the end of their studies, students will possess the ability to solve problems and communicate solutions in rigorous mathematical language, to communicate mathematical concepts effectively, and to conduct independent research.

Entering graduate students are advised initially by an assigned faculty mentor. Within the first two years, and typically after passing the preliminary examinations, the student selects a Ph.D. advisor in the area of the student's research interest.

Each graduate student is expected to consult with their advisor to formulate a plan of study and research. The student's advisor ultimately will be the student's thesis advisor.

Ph.D. students are expected to obtain their Ph.D. degree within six years. Students admitted to the Ph.D. program may receive a master's degree en route to the Ph.D.

Advancement to Candidacy

Course Requirements

A three-course sequence in each of the three fields of algebra, analysis, and geometry-topology (manifolds) will be offered each year. Preliminary examinations will be

given for each core sequence at the beginning, middle, and end of each academic year.

First-level passage of a preliminary examination satisfies the core sequence requirement for that field. Ph.D. students are required to complete the full core sequence in the field associated with the preliminary examination in which they do not achieve a first-level pass. The core sequences are as follows:

MATH 200	Algebra I	5
MATH 201	Algebra II	5
MATH 202	Algebra III	5
MATH 204	Analysis I	5
MATH 205	Analysis II	5
MATH 206	Analysis III	5
MATH 208	Manifolds I	5
MATH 209	Manifolds II	5
MATH 210	Manifolds III	5

The following course:

MATH 288A	Pedagogy of Mathematics	2
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Students are also required to complete six additional courses in mathematics.

No more than three courses may be independent study or thesis research courses. Sample courses include:

MATH 203	Algebra IV	5
MATH 207	Complex Analysis	5
MATH 211	Algebraic Topology	5
MATH 212	Differential Geometry	5
MATH 213A	Partial Differential Equations I	5
MATH 213B	Partial Differential Equations II	5
MATH 214	Theory of Finite Groups	5
MATH 215	Operator Theory	5
MATH 216	Advanced Analysis	5
MATH 217	Advanced Elliptic Partial Differential Equations	5
MATH 218	Advanced Parabolic and Hyperbolic Partial Differential Equations	5
MATH 219	Nonlinear Functional Analysis	5
MATH 220A	Representation Theory I	5
MATH 220B	Representation Theory II	5
MATH 222A	Algebraic Number Theory	5
MATH 222B	Algebraic Number Theory	5
MATH 223A	Algebraic Geometry I	5
MATH 223B	Algebraic Geometry II	5
MATH 225A	Lie Algebras	5
MATH 225B	Infinite Dimensional Lie Algebras	5

MATH 226A	Infinite Dimensional Lie Algebras and Quantum Field Theory I	5
MATH 226B	Infinite Dimensional Lie Algebras and Quantum Field Theory II	5
MATH 227	Lie Groups	5
MATH 228	Lie Incidence Geometries	5
MATH 229	Kac-Moody Algebras	5
MATH 232	Morse Theory	5
MATH 233	Random Matrix Theory	5
MATH 234	Riemann Surfaces	5
MATH 235	Dynamical Systems Theory	5
MATH 238	Elliptic Functions and Modular Forms	5
MATH 239	Homological Algebra	5
MATH 240A	Representations of Finite Groups I	5
MATH 240B	Representations of Finite Groups II	5
MATH 246	Representations of Algebras	5
MATH 248	Symplectic Geometry	5
MATH 249A	Mechanics I	5
MATH 249B	Mechanics II	5
MATH 249C	Mechanics III	5
MATH 252	Fluid Mechanics	5
MATH 254	Geometric Analysis	5
MATH 256	Algebraic Curves	5
MATH 260	Combinatorics	5
MATH 280	Topics in Analysis	5
MATH 281	Topics in Algebra	5
MATH 282	Topics in Geometry	5
MATH 283	Topics in Combinatorial Theory	5
MATH 284	Topics in Dynamics	5
MATH 285	Topics in Partial Differential Equations	5
MATH 286	Topics in Number Theory	5
MATH 287	Topics in Topology	5

Foreign Language Requirements

The foreign language requirement must be satisfied before taking the oral qualifying examination. Graduate students in the Ph.D. program are required to demonstrate knowledge of French, German, or Russian, sufficient to read the mathematical literature in the language. Any member of the mathematics faculty may administer a foreign language examination.

The examination can be either oral or written. It typically requires translation of a text in one of the three foreign languages into English.

The Report on Language Requirement Form must be filled out by the student and the faculty member administering the examination. The form can be found on the Graduate Division website or can be provided by the Mathematics Department. The form should be turned in

to the graduate advisor and program coordinator for review and submission to the Graduate Division.

Teaching Requirement

Ph.D. students must complete a minimum of three quarters as a teaching assistant (TA). All TAs are required to participate in the department's teaching assistant training program.

TA appointments are usually made at 50 percent time (an assigned workload of approximately 220 hours per quarter). TAs are under the supervision of the faculty member responsible for the course. TAs are covered by a collective bargaining agreement between the University of California and the United Auto Workers (UAW).

Instructors and their TA(s) will meet at the beginning of the quarter to complete the Notification of TA Duties form in order to identify the agreed upon tasks. The performance of these tasks will form the basis of the end-of-quarter performance evaluation and will use the following criteria: quality of work; accuracy and attention to detail; interaction with students, peers, and instructor; knowledge of subject; and dependability. The specific allocation of TA duties is subject to change, depending on enrollments and the number of teaching assistantships in the department allocation. The general duties vary, depending on the course assigned and level of the course.

Pre-Qualifying Requirements

Preliminary Examinations

Preliminary examinations are given for each core sequence in the fields of algebra, analysis, and geometry-topology at the beginning, middle, and end of each academic year. The exams will be designed and graded by a committee of three members.

A first-level pass signifies that the student has the basic knowledge to start research with a thesis advisor in this particular area. A second-level pass signifies that the student has a very good understanding of the basic concepts, but not necessarily enough to conduct independent research.

Ph.D. students must obtain a first-level pass on at least one of the three written preliminary examinations and a second-level pass on at least one other. Students must complete the full three-course sequence in the field associated with the preliminary examination in which they did not achieve a first-level pass. Students may take the preliminary examinations as often as they wish.

Ph.D. students should complete the preliminary examinations and core sequence requirements by the end of their second year in order to make satisfactory progress. If a graduate student does not fulfill these requirements by the end of their second year, they may be placed on academic probation, depending on their progress in the program. If a graduate student has not fulfilled these requirements by the end of their third year, they are subject to dismissal from the program.

Topics for the preliminary examinations include:

- Algebra
 - Linear algebra
 - Group theory
 - Ring and module theory
 - Field theory
 - Galois theory
- Analysis
 - Basic analysis
 - General topology
 - Metric spaces
 - Measure and integration
 - Complex analysis
 - Functional analysis
- Geometry-topology (manifolds)
 - Manifold and tangent bundle
 - Differential forms and integration on manifolds
 - Fundamental group and covering space
 - (Co)homology
 - Differential geometry

Qualifying Examination

Oral Qualifying Examination

All graduate students in the Ph.D. program are required to take an oral examination, called the oral qualifying examination, for advancement to candidacy for the Ph.D. degree. Students typically complete this examination between their 7th and 9th quarter in residence.

Students will demonstrate that they have a sufficient understanding of their Ph.D. thesis problem. Any student who has not passed their oral exam by the end of the fourth year may be subject to academic probation or dismissal from the program.

The Report on Qualifying Examination Form must be filled out by the qualifying examination committee immediately following the examination. The form can be found on the Graduate Division website or can be provided by the Mathematics Department. The form should be turned in to the graduate advisor and program coordinator for review and submission to the Graduate Division. The student may request to see a copy of the report.

If the student fails the examination, a re-examination can be given within the next three months. The membership of the examining committee usually remains fixed.

Qualifying Examination Committee Composition

The examining committee consists of the student's faculty advisor, at least two other faculty members from the Mathematics Department, and at least one outside tenured faculty member from either another discipline at UCSC or another academic institution (involved in research and graduate education of the same or different discipline). The student, in consultation with the student's faculty advisor, selects the committee. The chair of the committee must be someone other than the student's faculty advisor.

The Graduate Division must approve the committee. The Committee Nomination of Ph.D. Qualifying Examination Form must be completed and submitted at least one month prior to the requested exam date. The form can be found on the Graduate Division website or can be provided by the Mathematics Department. The form should be turned in to the graduate advisor and program coordinator for review and submission to the Graduate Division.

The committee decides on the topics for the examination, which should be broad enough to encompass a substantial body of knowledge in the area of the student's interest. The written list of topics to be included in the examination, along with a short bibliography, is prepared by the student. A copy is given to each committee member and a copy is put into the student's permanent records.

Post-Qualifying Requirements

Dissertation Reading Committee Composition

A Ph.D. student, in consultation with the graduate vice chair, is responsible for selecting a dissertation reading committee. The committee consists of the student's advisor and at least two other members of the mathematics faculty. In special circumstances, a committee member may be chosen from another department and/or from another institution. The student's advisor is the chair of the committee.

The Graduate Division must approve the committee. The Nominations for Dissertation Reading Committee Form must be completed and submitted prior to advancement to candidacy. The form can be found on the Graduate Division website or can be provided by the Mathematics Department. The form should be turned in to the graduate advisor and program coordinator for review and submission to the Graduate Division.

A new form must be submitted for approval if changes to the dissertation reading committee must be made.

Advancement to Candidacy

To make satisfactory progress, a Ph.D. student should advance to candidacy by the end of their fourth year. A

Ph.D. student who has not advanced to candidacy by the end of the fourth year will be placed on academic probation or be subject to dismissal from the program.

Students must complete the following in order to advance to candidacy:

1. Complete the preliminary examinations and core sequences in accordance with the requirements outlined above;
2. Satisfy the language requirement;
3. Pass the qualifying examination;
4. Have a dissertation reading committee approved by the Mathematics Department and the Graduate Division;
5. Have no incomplete grades (I) on their record.

An advancement to candidacy fee will be billed to the student's account. The student will be officially advanced the following term after all of these requirements are met.

[Optional Catchall]

Dissertation

Dissertation

Each graduate student in the Ph.D. program is required to write a Ph.D. dissertation or thesis on a research topic in mathematics. The Ph.D. dissertation should contain original research results that are publishable in a peer-reviewed journal. All members of the student's dissertation committee must read and approve the dissertation.

More information about dissertation submission can be found at the Graduate Division website.

Dissertation Defense

After the dissertation has been approved, the student has an option of making a public oral presentation of the mathematical results contained in the dissertation—the "thesis defense." A recommendation by the dissertation committee will be made to the Mathematics Department and to the Graduate Council on the granting of the Ph.D. degree.

Academic Progress

Ph.D. students are expected to adhere to the below degree timetable:

1. Preliminary examinations and course sequence requirements
Completed by the end of the student's 2nd year
2. Language examination
Completed by the end of the student's 3rd year
3. Oral qualifying examination (and advancement to candidacy)
Completed no later than student's 9th quarter

4. Dissertation defense

Completed no later than the end of the 6th year

Annual meetings with the graduate vice chair and the graduate advisor and program coordinator are conducted with each student on a one-on-one basis. These meetings serve to notify the student of their current progress within the program and outline expectations for the continuation of normative progress toward the Ph.D. degree.

Applying for Graduation

Ph.D. students must complete the Application for the Doctor of Philosophy degree form by the appropriate quarter's deadline listed in the current Academic and Administrative Calendar.

The form can be found on the Graduate Division website or can be provided by the Mathematics Department. The form should be turned in to the graduate advisor and program coordinator for review and submission to the Graduate Division.

[Optional Catchall]

Microbiology and Environmental Toxicology

430 Physical Sciences Building
Telephone (831) 459-4719
FAX (831) 459-3524
<https://www.metx.ucsc.edu>

PROGRAMS OFFERED

Contiguous Bachelor's/Master's Pathway (p. 351)

Microbiology and Environmental Toxicology M.S. (p. 352)

Microbiology and Environmental Toxicology Ph.D. (p. 353)

Microbiology and Environmental Toxicology Designated Emphasis (p. 355)

OTHER PROGRAMS OF INTEREST

Microbial Biology and Pathogenesis Track within the Program in Biomedical Sciences and Engineering (PBSE)

The Microbiology and Environmental Toxicology Department (METX) offers undergraduate and graduate courses in microbiology and environmental toxicology, both within the department and through affiliated departments. The curriculum provides a strong foundation in fundamental and applied toxicology and microbiology to achieve the breadth and depth of perspective required for this interdisciplinary science. Research interests of students and faculty in METX span the fields of biology, microbiology, chemistry, Earth sciences, ocean sciences, environmental studies, and human health.

UNDERGRADUATE PROGRAM

The METX Department only awards graduate degrees, although it does offer a select number of undergraduate courses to prepare and attract promising undergraduates for advanced studies in microbiology and environmental toxicology or health-related disciplines. Students interested in microbiology and environmental health should major in a field such as biology; marine biology; molecular, cell, and developmental biology; biochemistry; chemistry; Earth sciences; engineering; or environmental studies while taking microbiology and environmental toxicology electives.

In addition, the program provides unique opportunities for exceptional undergraduates to conduct research in microbiology and environmental toxicology. These opportunities are limited to students who have demonstrated their potential in undergraduate courses in the basic sciences and environmental health. With department approval, these undergraduates may also take graduate courses in microbiology and environmental toxicology, that coursework may be applied toward a graduate degree in microbiology and environmental toxicology if the student is accepted into the program.

MICROBIOLOGY AND ENVIRONMENTAL TOXICOLOGY CONTIGUOUS BACHELORSMASTERS PATHWAY

METX offers a fifth-year Plan I (thesis) M.S. degree path when earned contiguous with an appropriate Bachelor of Science (B.S.) degree at UCSC. The fifth-year M.S. path provides highly motivated undergraduate majors the opportunity to earn separate B.S. and M.S. degrees in five years. The path provides the additional level of preparation and experience that students need to pursue careers in industry, government, or to increase their competitiveness for top Ph.D. programs.

To be accepted to the path, students will need to prepare an application in consultation with their Plan I and undergraduate advisor and plan for their fifth-year BS/MS, providing evidence of solid academic performance in general and in their undergraduate major. The application should be submitted by Aug. 1st prior to their senior year, and should include:

- A one-page personal statement describing a) the student's motivation and academic preparation for entering the path; b) the student's goals for the fifth-year path, including the area of concentration; c) the name of a faculty member willing to serve as their thesis advisor (if appropriate); and d) future professional goals.

- Copy of unofficial transcripts establishing the GPA requirements in the undergraduate major and overall. Applicants should possess a GPA in courses of their undergraduate major (biology, chemistry, etc.) of 3.2 or above, and an overall GPA of 3.0 or above.
- A letter of recommendation from the METX faculty member attesting to the student's promise for a M.S. degree in METX.
- A coursework plan that will enable them to complete both the requirements for the B.S. in their undergraduate department and M.S. in METX in five years, including demonstrating sufficient coursework capacity to complete at least one to two METX graduate courses in their final undergraduate year.

If accepted into the fifth-year B.S./M.S. path, students will go through the regular METX M.S. application process early in their senior year. The criteria for admission to the METX M.S. program will be the same as for all METX M.S. program applicants.

MICROBIOLOGY AND ENVIRONMENTAL TOXICOLOGY M.S.

Introduction

The Microbiology and Environmental Toxicology Department offers a master of science (M.S.) degree in microbiology and environmental toxicology (METX). The METX M.S. degree can be attained through Plan I thesis (coursework and thesis, minimum 40 credits) or Plan II (coursework and capstone project, minimum 40 credits). In addition, METX offers a fifth-year Plan I (thesis) M.S. degree path when earned contiguous with an appropriate bachelor of science (B.S.) degree at UC Santa Cruz. The METX M.S. degree combines core courses and electives to provide interdisciplinary training in microbiology, toxicology, and environmental health sciences. Graduates from the program are exceptionally prepared to take research or management positions in organizations concerned with microbial and environmental health-related sciences. Graduates may also pursue fields in education or enter doctoral programs in biological and environmental health sciences or related fields.

Requirements

Course Requirements

Plan I (coursework, research, and thesis) M.S. degree

Prospective students who are interested in research careers, or gaining research experience prior to entering a doctoral program, may consider the thesis M.S. degree (Plan I).

Two required core courses:

METX 200	Interdisciplinary Approaches in Environmental Toxicology	5
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One course from the following:

METX 205	Scientific Grant Writing	5
METX 245A	Scientific Communication in Microbiology and Environmental Toxicology A	5

Two courses from the following:

METX 201	Sources and Fates of Pollutants	5
METX 202	Cell and Molecular Toxicology	5
METX 206A	Advanced Microbiology	5
METX 210	Molecular and Cellular Basis of Bacterial Pathogenesis	5
METX 238	Pathogenesis: Molecular Mechanisms of Disease	5
METX 250	Environmental Microbiology	5
METX 270	Drug Action and Development	5

Any additional courses

As recommended by your first-year Advising Committee

Each quarter, students must enroll in:

METX 292	Introductory Graduate Seminar	
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And one of the following:

METX 299A	Thesis Research	5
METX 299B	Thesis Research	10
METX 299C	Thesis Research	15

Each quarter, students must enroll in the lab meeting associated with their primary instructor (1):

METX 281C	Topics in Environmental Microbiology	2
METX 281M	Topics in Molecular Toxicology	2
METX 281O	Topics in Bacterial Pathogenesis	2
METX 281S	Cellular and Organismal Responses to Toxicants	2
METX 281V	Topics in Bacterial Pathogenesis and Innate Immunity	2
METX 281Y	Biofilms: Processes and Regulation	2
METX 281J	Mechanisms of Virulence and Resistance to Infectious Disease	2
METX 281R	Topics in Genome-Environment Interactions	2

Plan II (Coursework and Capstone) M.S. Degree

The Plan II coursework M.S. degree may be of interest to students interested in interdisciplinary graduate training in microbiology and environmental health-related fields, but with career goals other than research, such as government service, non-profit NGOs, and private sector biotech and environmental health companies.

Required core course:

METX 200	Interdisciplinary Approaches in Environmental Toxicology	5
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Two courses from the following:

METX 201	Sources and Fates of Pollutants	5
METX 202	Cell and Molecular Toxicology	5
METX 206A	Advanced Microbiology	5
METX 210	Molecular and Cellular Basis of Bacterial Pathogenesis	5

One course from the following:

METX 238	Pathogenesis: Molecular Mechanisms of Disease	5
BIOL 217	Influence of Environment and Experience on Brain Development	5

At least one additional course

At least one additional course approved graduate-level METX course or from another department.

At least one additional approved general elective course

From METX or from another department

Each quarter, students must enroll in the following course:

METX 292	Introductory Graduate Seminar
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Winter and Spring Quarter Capstone Courses

Both of the following courses:

METX 245A	Scientific Communication in Microbiology and Environmental Toxicology A	5
METX 245B	Scientific Communication in Microbiology and Environmental Toxicology B	5

Other Requirements**Plan I (coursework, research, and thesis)****M.S. degree****Literature review**

Under direction of the student's advisor, write a literature review of the current state of the field of the proposed dissertation research. The written review will be handed in to the student's advisor at the end of the summer of the first year.

Department seminars

Give a 20-minute departmental seminar in the first academic year and one 50-minute departmental seminar on thesis work during the spring of the second year.

Master's comprehensive examination

The master's comprehensive exam is a presentation and defense of the student's master's research proposal, including relevant background knowledge. The examination will not be specifically course-based, but will draw on knowledge from courses. This examination is taken in the fall quarter of the second year.

Thesis

Students are required to submit a thesis for fulfillment of the degree requirements. The thesis should be submitted to the student's master's reading committee one month before the due date.

Plan II (coursework and capstone) M.S. degree**Capstone Writing Project:**

Plan II M.S. students will also complete a capstone writing project (METX 245A and METX 245B) to be completed under the guidance/mentorship of a faculty member in the department. As an example, capstone projects may include a scientific research proposal or a substantial review article.

[Optional Catchall]**Applying for Graduation****MICROBIOLOGY AND ENVIRONMENTAL TOXICOLOGY PH.D.****Introduction**

METX training includes robust critical thinking, project design, oral and written communication, and in-depth field-specific knowledge.

Key components of METX Ph.D. training include a minimum six courses, plus BIOL 289.

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First-quarter training introduces students to critical thinking and how to approach complex problems in

environmental health: METX 200, Interdisciplinary Approaches to Problems at the Interface of Microbiology and Environmental Toxicology.

- Second-quarter training builds expertise in their area of interest, microbiology or environmental toxicology, by taking METX 206A or METX 202. These classes build students' foundational knowledge of microbiology or environmental toxicology, understanding of methodological approaches, and mastering experimental design and skills in research project design.

- Second-quarter training further exposes students to multidisciplinary approaches by taking BIOL 200F, a Program in Biomedical Sciences & Engineering (PBSE) core course. This class will provide students with samples of multidisciplinary tools and approaches and an appreciation of their strengths and limitations, as well as working in teams.

- Third-quarter training provides in-depth field and methodology competency, project design, written communication, and research ethics. Ph.D. students will take:

- One of METX 210, METX 238, METX 201, or METX 250 which provides additional topic-related content and methodology, and skills at crafting and defending a research project on a non-thesis topic.

- METX 205. Develop student's ability to craft grant proposals and to write clearly

- BIOL 289, Practice of Science. Instruction in responsible conduct of research.

- Fourth quarter, fall quarter of 2nd year:

Oral and written presentation skills training through coursework and yearly departmental presentations and scientific writing and literature mastery through the writing of a literature review in the first year.

Weekly seminars expose students to the breadth of our fields and provide students with opportunities to interact closely with speakers and form connections and collaborations.

Qualifying examinations designed to perfect the student's ability to craft and defend research plans.

Extensive laboratory research training that starts immediately upon entering the program and culminates in the student's Ph.D. dissertation or master's thesis.

Advancement to Candidacy

The student advances to candidacy after completing all coursework, completing the literature review, giving the third-year seminar and passing the Ph.D. qualifying examination.

Course Requirements

Four required core courses:

METX 200	Interdisciplinary Approaches in Environmental Toxicology	5
METX 205	Scientific Grant Writing	5
BIOL 200F	Logic and Approaches to Scientific Discovery	5
BIOL 289	Practice of Science	5

One course from the following:

METX 202	Cell and Molecular Toxicology	5
METX 206A	Advanced Microbiology	5

At least one additional approved graduate-level METX course or from another department:

METX 201	Sources and Fates of Pollutants	5
METX 210	Molecular and Cellular Basis of Bacterial Pathogenesis	5
METX 238	Pathogenesis: Molecular Mechanisms of Disease	5
METX 250	Environmental Microbiology	5
METX 270	Drug Action and Development	5

Any two additional courses as recommended by your first-year advising committee.

The following course each quarter:

METX 292	Introductory Graduate Seminar	
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And one of the following as appropriate:

METX 297A	Independent Study	5
METX 297B	Independent Study	10
METX 297C	Independent Study	15
METX 299A	Thesis Research	5
METX 299B	Thesis Research	10
METX 299C	Thesis Research	15

Plus a topical seminar from the METX 281 series:

METX 281A	Topics in Environmental Toxicology	5
METX 281C	Topics in Environmental Microbiology	2

METX 281J	Mechanisms of Virulence and Resistance to Infectious Disease	2
METX 281M	Topics in Molecular Toxicology	2
METX 281O	Topics in Bacterial Pathogenesis	2
METX 281P	Origins and Applications of Human Gut Microbial Symbiosis	2
METX 281R	Topics in Genome-Environment Interactions	2
METX 281S	Cellular and Organismal Responses to Toxicants	2
METX 281V	Topics in Bacterial Pathogenesis and Innate Immunity	2
METX 281Y	Biofilms: Processes and Regulation	2

Foreign Language Requirements

Teaching Requirement

Doctoral students are required to work as teaching assistants (TA) for at least one quarter. Priority for TA positions is given to first-year doctoral students, then to current doctoral students who have not yet worked as a teaching assistant. Fulfilling this requirement may happen pre- or post-candidacy.

Pre-Qualifying Requirements

Qualifying Examination

Ph.D. qualifying examination (QE). Present and defend a dissertation research proposal to the student's Ph.D. QE committee. The student must complete Ph.D. QE no later than the end of fall quarter of the third year.

Post-Qualifying Requirements

Literature Review

Under direction of the student's advisor, write a literature review of the current state of the field of the proposed dissertation research. The written review will be handed in to the student's advisor and the program graduate advisor by the first day of fall quarter of the second year.

Department Seminar

Give a 10-20-minute departmental seminar each academic year, and one 50-minute departmental seminar during the fall quarter of the third year. Rotation students give their rotation talks in lieu of a departmental seminar.

[Optional Catchall]

Dissertation

Dissertation and Defense

The student must submit their doctoral dissertation to the dissertation committee for tentative approval at least one

month before presenting a formal, public doctoral research seminar.

Academic Progress

Applying for Graduation

[Optional Catchall]

MICROBIOLOGY AND ENVIRONMENTAL TOXICOLOGY DESIGNATED EMPHASIS

Introduction

Master of arts (M.A.) degree and doctoral students from departments at UC Santa Cruz may complete a Designated Emphasis (DE) in Microbiology and Environmental Toxicology (METX) by completing two graduate courses in METX (from an approved list) and one quarter of METX 292, the weekly departmental seminar. In addition, students may have a Microbiology and Environmental Toxicology faculty member on their qualifying examination committee, and must have a Microbiology and Environmental Toxicology faculty member on their thesis reading committee, complete a significant scholarly written component on a microbiology and/or environmental health/toxicology related topic, and complete the requirements for an M.A. degree or Ph.D. in their own department.

Requirements

Doctoral and master's students completing the following requirements, in addition to the degree requirements of their home department, will receive the Designated Emphasis in Microbiology and Environmental Toxicology:

Committee Composition and Departmental Approvals

The student must have a designated graduate advisor from the faculty of the Department of Microbiology and Environmental Toxicology, who may also serve on the Ph.D./M.A. qualifying exam committee and must serve on the Ph.D. dissertation/master's thesis reading committee.

Course Requirements

At least two of METX courses from the following list for a minimum of 10 credits:

METX 200	Interdisciplinary Approaches in Environmental Toxicology	5
METX 201	Sources and Fates of Pollutants	5
METX 202	Cell and Molecular Toxicology	5

METX 206A	Advanced Microbiology	5	Human Biology B.S. (p. 362)
METX 210	Molecular and Cellular Basis of Bacterial Pathogenesis	5	Molecular, Cell and Developmental Biology B.S. (p. 367) Neuroscience B.S. (p. 372)
METX 238	Pathogenesis: Molecular Mechanisms of Disease	5	Biology Minor (p. 377)
METX 250	Environmental Microbiology	5	Molecular, Cell and Developmental Biology M.S. (p. 377)
METX 270	Drug Action and Development	5	Molecular, Cell and Developmental Biology Ph.D. (p. 378)

Additional Requirements and Application Information

In addition, students must:

1. Attend METX department seminars (enroll in METX 292, 0 credits) for at least one quarter. Optionally, the student can schedule a presentation on their research for the departmental seminar series.
2. Include a significant scholarly written component (e.g., a dissertation chapter or a paper to be submitted for publication) on an appropriate topic in microbiology, environmental toxicology, and/or environmental health. The content, length, and topic requires approval by the METX faculty committee member.

Application Process:

Students who wish to pursue the DE in METX will submit an application to the METX Department. The application will include:

- identification of a METX faculty advisor and their signature of approval, along with signature from your primary faculty advisor;
- list of the courses that will be taken and when; and
- copies of the unofficial transcripts.

Students should submit their application to the METX Department at: metxadmn@ucsc.edu.

Completion of the DE in METX:

Upon completion of the DE in METX, students will submit a completion form. The form is to be submitted to the METX Graduate Program coordinator.

Molecular, Cell, and Developmental Biology

Molecular, Cell and Developmental Biology Department
225 Sinsheimer Laboratories
(831) 459-4986
<https://mcd.ucsc.edu/>

PROGRAMS OFFERED

Biology B.S. (p. 357)

OTHER PROGRAMS OF INTEREST

Science Education B.S. (p. 398)

Biochemistry and Molecular Biology B.S. (p. 251)

This is an extraordinary time to be involved in biomedical research. New technologies are rapidly changing our understanding of the molecular and cellular basis of life, with dramatic implications for how we treat human disease. Members of the Department of Molecular, Cell and Developmental Biology, along with affiliated faculty in the departments of Biomolecular Engineering, Chemistry and Biochemistry, Microbiology and Environmental Toxicology, and Physics, are participating in an extraordinary revolution in biomedical science. A broad spectrum of cutting-edge research tools are being employed to tackle problems in key areas that include: the structural and functional role of RNA in regulation of gene expression; chromatin biology and epigenetic control of genes; the cell biology of the cytoskeleton and the cell cycle; decisions controlling embryogenesis and organ development; and developmental neurobiology. The insights generated by this basic research enable new strategies for treatments of aging disorders, birth defects, neurological diseases, cancer and other human ailments. The department offers a spectrum of courses that reflect the exciting new developments and directions in these fields, and trains students to participate in these exciting fields.

UNDERGRADUATE PROGRAM

Students may plan a program that leads to one of several Bachelor of Science (B.S.) degrees. Students may choose from the following major options:

Biology B.S. (p. 357)

Human biology B.S. (p. 362)

Molecular, cell and developmental biology B.S. (p. 367)

Neuroscience B.S. (p. 372)

Students may choose from one minor option

Biology minor (p. 377)

Advanced undergraduates, with the guidance of faculty mentors, have access to extensive departmental

laboratory facilities for independent research. Many students take advantage of the numerous opportunities with local physicians, health care providers, and biotech companies to gain experience in a real world setting. This array of opportunities for directed independent study enables biological science majors to enhance their upper-division programs to reflect and strengthen their own interests and goals.

GRADUATE PROGRAM

The program in Molecular, Cell and Developmental (MCD) biology (courses BIOL) leads to either the doctor of philosophy (Ph.D.) or the Master of Science (M.S.) and is designed to prepare students for careers in research, teaching, and biotechnology. Current research in MCD Biology focuses on such topics as the structure and function of RNA, gene expression, chromatin structure, epigenetics, cell signaling, cell division, development, nerve cell function, and stem cell biology.

BIOLOGY B.S.

Information and Policies

Introduction

Biology has entered into an exciting new era in which phenomena that once seemed insoluble mysteries—such as embryonic development, the functions of the brain, and the dynamics of ecosystems—are now yielding their secrets as the technology to study them becomes more and more sophisticated. From molecular biology, with its potential to revolutionize medicine and agriculture, to ecology, with its lessons for the sustainable management of the environment, biologists are fully engaged in meeting the challenges of the future, helping to improve the quality of human life, and to preserve habitats and biodiversity. Thus, it is no surprise that biology is at the heart of many of today's most pressing intellectual and social concerns. The Biology B.S. degree program gives students a rigorous education in modern biology, while allowing a student the opportunity to select from a wide array of upper-division elective courses offered by the departments of Molecular, Cell and Developmental Biology and Ecology and Evolutionary Biology. With proper advance planning, a student with virtually any degree can prepare a competitive application for medical school or health care professional school. Check the Health Careers webpage for more information on how you can academically prepare for a career in health care. Additional information is available at the UCSC Career Center.

Academic Advising for the Program

Students should take full advantage of academic advising and should keep in frequent contact with the advisors to stay informed about late announcements of courses, changes in scheduling, and opportunities for special study. Transfer students should also consult the Transfer Information and Policy Section. For additional advice and information:

MCD Advising
389 Thimann Labs
mcdadvising@ucsc.edu

Getting Started in the Major

Prerequisites

Due to the demanding nature of the major, students must begin their science coursework as early as possible. MATH 11A or MATH 19A; CHEM 1A, CHEM 1B, CHEM 1C, and CHEM 8A; and BIOL 20A, BIOE 20B, and BIOL 20L must be completed before the sixth quarter in order for students to qualify for admission to MCD biology-sponsored majors, including the biology B.S., human biology B.S., molecular, cell and developmental biology B.S. and neuroscience B.S. majors. For an overview of prerequisites and getting started in the major, please visit our biology B.S. site.

An online mathematics placement examination is required to enroll in a math course. Biological science majors are expected to take this examination and are encouraged to work in the learning modules until they place into calculus. For more information see the mathematics placement website.

Program Learning Outcomes

Students who successfully complete the Biology major will be able to:

- Demonstrate knowledge of how biochemistry, genetics, and molecular biology are used to elucidate both the function of cells and their organization into tissues.
- Recognize that biology has a basis in chemistry, physics, and mathematics.
- Describe how scientific method is used to explain natural phenomena.
- Use effective oral and written language skills to communicate scientific data and ideas.
- Understand safe laboratory practices and perform basic molecular biology techniques.
- Generate hypotheses, evaluate data, and design experiments to investigate a scientific problem.
- Present broad knowledge in biochemistry, genetics, evolutionary biology, cell biology, developmental biology, physiology, and ecology.

Major Qualification Policy and Declaration Process

Major Qualification

The Department of Molecular, Cell and Developmental Biology has a qualification policy that applies to the biology B.S., molecular, cell and developmental biology B.S., and neuroscience B.S. majors.

To qualify for any of these majors, students must pass (with a grade of C or better) the following courses or their equivalents:

One of the following courses

MATH 11A	Calculus with Applications	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5

and all of the following courses

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1C	General Chemistry	5
CHEM 8A	Organic Chemistry	5
BIOL 20A	Cell and Molecular Biology	5
BIOE 20B	Development and Physiology	5

and one of the following courses

BIOL 20L	Experimental Biology Laboratory	2
BIOL 102J	Toxic RNA Lab I	5

Appeal Process

Students who are not eligible to declare the major may submit an appeal to the Molecular, Cell and Developmental Biology faculty advisor. The department will notify the student and their college of the decision within 15 days of the quarterly appeal deadline. See our appeal process for more information.

How to Declare a Major

Students should submit a petition to declare by completing the online declaration petition as soon as they complete the major qualification courses or reach their declaration deadline quarter, whichever comes first.

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed major qualification courses.

Each major/minor advising office has a process for declaring. To initiate the process to declare, please complete the online declaration petition located on the Department of MCD Biology website. For assistance, please contact MCD biology advising at mcdadvising@ucsc.edu.

Transfer Information and Policy

Transfer Admission Screening Policy

MCD Biology encourages applications from transfer students in the biological sciences. The department has a major qualification policy that limits access to the program to students who have successfully completed a

subset of foundational coursework. Transfer students are held to similar criteria when being assessed for admission to UCSC as an MCD-sponsored major. See qualifying for the major as a transfer applicant for more information.

To be considered for admission as a biology B.S. major, transfer students must complete the following courses or their equivalents prior to transfer, by the end of the spring term for students planning to enter in the fall.

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1C	General Chemistry	5
CHEM 8A	Organic Chemistry	5
BIOL 20A	Cell and Molecular Biology	5
BIOL 20L	Experimental Biology Laboratory	2
BIOE 20B	Development and Physiology	5

Plus, one of the following calculus courses:

MATH 11A	Calculus with Applications	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5

The CHEM 8A and MATH 11A or MATH 19A requirement will be enforced for transfer students entering in the fall of 2022 and thereafter. BIOL 20L is not required for students who have completed BIOL 20A and BIOE 20B from California community colleges.

In addition, the following courses are recommended prior to transfer to ensure timely graduation.

One of the following courses

MATH 11B	Calculus with Applications	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

Plus one of the following options

Either this course		
STAT 5	Statistics	5
or these courses		
STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

Plus both of the following courses

CHEM 8B	Organic Chemistry	5
CHEM 8L	Organic Chemistry Laboratory	2

Getting Started at UCSC as a Transfer Student

Transfer students who have met the major qualification requirements are encouraged to declare the major during their first quarter at UC Santa Cruz. Transfer students should complete the required courses in genetics (BIOL 105), biochemistry (BIOL 100), and molecular biology (BIOL 101 and BIOL 101L) by the end of their first year at UCSC since they are prerequisites for the majority of other required courses.

Letter Grade Policy

All courses that are taken to satisfy any major requirement must be taken for a letter grade.

[Optional Catchall]

Course Substitution Policy

At least half of the upper-division courses required for the major must be taken at UC Santa Cruz, not as transfer credits from another institution. If a student plans to transfer to UCSC from another institution, the student is advised to contact MCD Advising at UCSC before enrolling in upper-division courses at the student's institution or any institution other than UCSC. This advising will help students understand the limitation of transferring upper-division courses from other institutions to UCSC. For more information on transferring courses to UCSC, please consult the undergraduate website.

Once matriculated, a student must receive permission from the department to satisfy the BIOL 20A, BIOL 100, BIOL 105, BIOL 101 or BIOL 110 requirements with courses taken at other institutions. Students who wish to receive credit toward the major for these or other courses taken either at UCSC or at another institution should contact MCD Advising.

Double Majors and Major/Minor Combinations Policy

Students interested in pursuing multiple majors within the biological sciences may NOT declare the following combination of majors:

- Biology (B.A., B.S., or minor) AND any other biological sciences major

Should a student choose to double major, they must qualify for and complete the disciplinary communication and comprehensive requirements for each of the majors.

Study Abroad

The UC Education Abroad Program (EAP) offers qualified students unique opportunities to broaden their educational horizons. The MCD Biology Department encourages interested students to participate. Many programs are in English-speaking countries or use English for advanced courses. Many programs offer small classes, extensive laboratories, and/or field research experience.

Students interested in study abroad need to get an early start on their basic science requirements, including chemistry, mathematics, and introductory biology and must declare their major prior to applying to go abroad. Students interested in studying abroad should visit the EAP office as soon as possible to begin planning. They should also seek advice about their EAP plan for major courses at UC Santa Cruz from MCD Advising and receive their approval.

Honors

Honors in the majors are awarded to graduating students whose academic performance demonstrates excellence at a grade point average (GPA) of 3.5 or above. Highest honors are awarded to those students whose performance demonstrates the highest level of excellence and results in a GPA of 3.8 or above.

Medical and Professional School Admission

Medical and professional school admissions requirements vary; students should verify that their coursework will satisfy the admissions requirements of the programs to which they plan to apply.

[Optional Catchall]

Requirements and Planners

Course Requirements

Lower-Division Courses

Students take one of the following courses

BIOL 20L	Experimental Biology Laboratory	2
BIOL 102J	Toxic RNA Lab I	5

Plus all of the following courses

BIOL 20A	Cell and Molecular Biology	5
BIOE 20B	Development and Physiology	5
BIOE 20C	Ecology and Evolution	5
CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2
CHEM 8A	Organic Chemistry	5
CHEM 8L	Organic Chemistry Laboratory	2
CHEM 8B	Organic Chemistry	5

BIOL 20L is waived for junior transfer students

Plus one of the following options:

Either these courses		
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5

or these courses			
MATH 19A	Calculus for Science, Engineering, and Mathematics	5	
MATH 19B	Calculus for Science, Engineering, and Mathematics	5	

Plus one of the following options:

Either this course			
STAT 5	Statistics	5	
or these courses			
STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5	
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2	

Plus one of the following options:

Either these courses			
PHYS 6A	Introductory Physics I	5	
PHYS 6L	Introductory Physics I Laboratory	1	
PHYS 6B	Introductory Physics II	5	
or these courses			
PHYS 6A	Introductory Physics I	5	
PHYS 6L	Introductory Physics I Laboratory	1	
PHYS 6C	Introductory Physics III	5	
or these courses			
PHYS 7A	Elementary Physics I	5	
PHYS 7B	Elementary Physics II	5	
PHYS 6L	Introductory Physics I Laboratory	1	

Note: PHYS 7A/PHYS 7B and PHYS 6L may not satisfy the physics prerequisite for admission to all medical schools; be sure to check the requirements at all schools where you wish to apply.

Upper-Division Courses**Choose one of the following options:**

Either these courses			
BIOL 100	Biochemistry	5	
BIOL 101	Molecular Biology	5	
or these courses			
BIOC 100A	Biochemistry and Molecular Biology	5	
BIOC 100B	Biochemistry and Molecular Biology	5	
BIOC 100C	Biochemistry and Molecular Biology	5	

Students who complete the BIOC 100A/BIOC 100B/BIOC 100C sequence can use BIOC 100C to satisfy an upper-division elective.

Plus all of the following courses:

BIOL 105	Genetics	5
BIOL 110	Cell Biology	5
BIOE 107	Ecology	5
BIOE 109	Evolution	5

Laboratory requirement:

Students must complete two upper-division courses that include regular laboratory or fieldwork:

Choose one of the following courses:

BIOL 101L	Molecular Biology Laboratory	2
BIOL 102L	Toxic RNA Lab II	5

Electives

Students must complete three additional upper-division electives (5-7 credits each) chosen from below:

Note: Some of the following courses fulfill the disciplinary communication (DC) requirement.

Note: Lecture/lab combinations count as one course.

BIOL 111A	Immunology I	5
BIOL 114	Cancer Cell Biology	5
BIOL 115	Eukaryotic Molecular Biology	5
BIOL 118	Principles of Human Genetics	5
BIOL 125	Introduction to Neuroscience	5
BIOL 120	Developmental Biology	5
BIOL 130	Human Physiology	5
BIOL 140	The RNA World	5
BIOC 100C	Biochemistry and Molecular Biology	5
BIOE 108	Marine Ecology	5
BIOE 112	Ornithology	5
BIOE 112L	Ornithology Field Studies	2
BIOE 114	Herpetology	5
BIOE 114L	Field Methods in Herpetological Research	2
BIOE 117	Systematic Botany of Flowering Plants	5
BIOE 117L	Systematic Botany of Flowering Plants Laboratory	2
BIOE 120	Marine Botany	5
BIOE 120L	Marine Botany Laboratory	2
BIOE 122	Invertebrate Zoology	5
BIOE 122L	Invertebrate Zoology Laboratory	2
BIOE 124	Mammalogy	5
BIOE 124L	Mammalogy Laboratory	2
BIOE 127	Ichthyology	5
BIOE 127L	Ichthyology Laboratory	2

BIOE 129	Biology of Marine Mammals	5	BIOE 128L	Large Marine Vertebrates Field Course	5
BIOE 129L	Biology of Marine Mammals Laboratory	2	BIOE 129	Biology of Marine Mammals	5
BIOE 131	Animal Physiology	5	BIOE 129L	Biology of Marine Mammals Laboratory	2
BIOE 133	Exercise Physiology	5	BIOE 137	Molecular Ecology	5
BIOE 134	Comparative Vertebrate Anatomy	5	BIOE 141L	Behavioral Ecology Field Course	5
BIOE 133L	Exercise Physiology Laboratory	2	BIOE 145	Plant Ecology	5
BIOE 134L	Comparative Vertebrate Anatomy Laboratory	2	BIOE 145L	Field Methods in Plant Ecology	5
BIOE 135	Plant Physiology	5	BIOE 150L	Ecological Field Methods Laboratory	5
BIOE 135L	Plant Physiology Laboratory	2	BIOE 151B	Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory	5
BIOE 137	Molecular Ecology	5	BIOE 153C	Disciplinary Communication for Biologists	5
BIOE 137L	Molecular Ecology Laboratory	2	BIOE 158L	Field Methods in Marine Ecology	5
BIOE 139	Mathematical Modeling and Data Science in Ecology and Evolution	5	BIOE 159A	Marine Ecology Field Quarter: Marine Ecology with Laboratory	5
BIOE 140	Behavioral Ecology	5	BIOE 161L	Kelp Forest Ecology Laboratory	5
BIOE 145	Plant Ecology	5	BIOE 171	Disciplinary Communication for Biologists	5
BIOE 147	Community Ecology	5	BIOE 172	Population Genetics	5
BIOE 149	Disease Ecology	5			
BIOE 155	Freshwater Ecology	5			
BIOE 161	Kelp Forest Ecology	5			
BIOE 163	Ecology of Reefs, Mangroves, and Seagrasses	5			
BIOE 163L	Ecology of Reefs, Mangroves, and Seagrasses Laboratory	2			
BIOE 165	Marine Conservation Biology	5			
BIOE 172	Population Genetics	5			
METX 119	Microbiology	5			
METX 135	Functional Anatomy	5			
METX 135L	Functional Anatomy Lab	2			

For 2-credit BIOE lab courses listed above that are taken concurrently with 5-credit lectures, both courses must be passed to receive one half of the DC requirement. BIOE 117 and BIOE 137 require concurrent enrollment in 2-credit labs, BIOE 117L and BIOE 137L, but these are not part of the DC requirement.

Disciplinary Communication (DC) Requirement

The DC requirement in the biology B.S. degree can be satisfied either by completing two BIOE courses or by completing one 5-credit BIOL lab.

For the BIOE option, choose two Ecology and Evolutionary Biology courses from this group:

Note: Lecture/lab combinations count as one course.

BIOE 108	Marine Ecology	5
BIOE 114	Herpetology	5
BIOE 114L	Field Methods in Herpetological Research	2
BIOE 117	Systematic Botany of Flowering Plants	5
BIOE 120	Marine Botany	5
BIOE 120L	Marine Botany Laboratory	2
BIOE 122	Invertebrate Zoology	5
BIOE 122L	Invertebrate Zoology Laboratory	2
BIOE 127	Ichthyology	5
BIOE 127L	Ichthyology Laboratory	2

For the BIOL option, choose one course from this group:

BIOL 103L	Toxic RNA Lab III	5
BIOL 105L	Eukaryotic Genetics Laboratory	5
BIOL 106L	Eukaryotic Genetic Engineering	5
BIOL 108L	Synthetic Gene Regulation Lab III	5
BIOL 109L	Yeast Molecular Genetics Laboratory	5
BIOL 115L	Eukaryotic Molecular Biology Laboratory	5
BIOL 120L	Development Laboratory	5
BIOL 121L	Environmental Phage Biology Laboratory	5
BIOL 186L	Undergraduate Research in MCD Biology	5

Comprehensive Requirement

All majors have a comprehensive requirement. For the Biology B.S., this requirement is satisfied via the

completion of the above laboratory or field course requirement.

Planners

Sample Biology B.S. First-Year Student Four-Year Planner

Additional first-year student sample planners

	Fall	Winter	Spring
1st (frosh)	CHEM 1A	CHEM 1B	CHEM 1C & CHEM 1N
	MATH 11A	MATH 11B	BIOL 20A
2nd (soph)	BIOE 20B & BIOL 20L	BIOL 100	BIOL 101 & BIOL 101L
	CHEM 8A & CHEM 8L	CHEM 8B	BIOL 105
3rd (junior)	BIOL 110	BIOE 107	BIOE 109
	BIOE 20C	PHYS 6A & PHYS 6L	PHYS 6B OR PHYS 6C
4th (senior)	Upper-division elective	STAT 5 OR STAT 7 & STAT 7L	Laboratory
		Upper-division elective	Upper-division elective

The following general education requirements will be fulfilled by the major requirements listed in the above planner: MF, SI, and SR. In addition to the GE requirements satisfied by the above courses, a student will also need to complete courses satisfying the CC, ER, IM, TA, PE, and PR general education requirements.

Sample Biology B.S. Transfer Two-Year Planner

Additional transfer student sample planners

	Fall	Winter	Spring
3rd	BIOL	BIOL 100	BIOL

(junior)	105		101 & BIOL 101L
	BIOE 107	PHYS 6A & PHYS 6L	PHYS 6B or PHYS 6C

4th(senior)	BIOL 110	Upper-division elective	Upper-division elective
	BIOE 109	Laboratory	Upper-division elective

This planner assumes that a student has completed all UC Transfer Pathway courses:

- General biology with lab (full introductory sequence) BIOL 20A, BIOE 20B, BIOL 20L, BIOE 20C
- General chemistry with lab (one-year sequence) CHEM 1A, CHEM 1B & CHEM 1M and CHEM 1C & CHEM 1N
- Calculus for STEM majors (one-year sequence) MATH 11A and MATH 11B
- Organic chemistry (full sequence with lab) CHEM 8A & CHEM 8L and CHEM 8B

HUMAN BIOLOGY B.S.

Information and Policies

Introduction

The human biology major is designed for students interested in careers in healthcare or biomedical research. Medical and professional school admissions requirements vary; students should verify that their coursework will satisfy the admissions requirements of the programs to which they plan to apply. Students are required to take introductory biology and laboratory (BIOL 20L), genetics, biochemistry, molecular biology, cell biology, human physiology with laboratory, and additional courses directly relevant to human health. As a unique feature of this program, students must also fulfill Spanish-language and health-care internship requirements. The courses required for this major satisfy many of the prerequisites for medical and other health professional schools. However, you should always check the specific requirements for every program you hope to apply. Check our Health Careers webpage for more information on how you can academically prepare for a career in health care. Additional information is available at the UCSC Career Center.

Academic Advising for the Program

Students should take full advantage of academic advising and should keep in frequent contact with the advisors to stay informed about late announcements of courses, changes in scheduling, and opportunities for special study. Transfer students should also consult the Transfer Information and Policy Section. For additional advice and information:

MCD Advising
389 Thimann Labs
mcdadvising@ucsc.edu

Getting Started in the Major

Prerequisites

Due to the demanding nature of the major, students must begin their science coursework as early as possible. MATH 11A or MATH 19A; CHEM 1A, CHEM 1B, CHEM 1C, and CHEM 8A; and BIOL 20A, BIOE 20B, and BIOL 20L must be completed before the sixth quarter in order for students to qualify for admission to MCD biology-sponsored majors, the biology B.S., human biology B.S., molecular, cell and developmental biology B.S., and neuroscience B.S. majors. For an overview of prerequisites and getting started in the major, please visit our Human Biology B.S. site.

An online mathematics placement examination is required to enroll in a math course. Biological science majors are expected to take this examination and are encouraged to work in the learning modules until they place into calculus. For more information see the mathematics placement website.

Students intending to major in human biology should take the Spanish placement examination, offered by the language program, to determine the level at which they should begin the Spanish sequence.

Program Learning Outcomes

Students who successfully complete the human biology major will be able to:

- demonstrate knowledge of how biochemistry, genetics, and molecular biology are used to elucidate both the function of cells and their organization into tissues;
- recognize that biology has a basis in chemistry, physics, and mathematics;
- describe how scientific method is used to explain natural phenomena;
- use effective oral and written language skills to communicate scientific data and ideas;
- understand safe laboratory practices, perform basic molecular biology techniques, generate hypotheses, and evaluate data;

- achieve fluency in Spanish and an understanding of how cultural differences can affect health care delivery;
- refine a career-related and/or postgraduate goal through internship experience;
- present advanced knowledge in the specialized field of human physiology.

Major Qualification Policy and Declaration Process

Major Qualification

The Department of Molecular, Cell and Developmental Biology has a separate qualification policy that applies to the human biology B.S. major.

To qualify for the human biology major, students must pass the following courses or their equivalents with a grade of C+ or better in each course:

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1C	General Chemistry	5
CHEM 8A	Organic Chemistry	5
BIOL 20A	Cell and Molecular Biology	5
BIOL 20L	Experimental Biology Laboratory	2
BIOE 20B	Development and Physiology	5

Students must also pass one of the following courses:

Either this course	MATH 11A	Calculus with Applications	5
or this course	MATH 19A	Calculus for Science, Engineering, and Mathematics	5

Appeal Process

Students who are not eligible to declare the major may submit an appeal to the Molecular, Cell and Developmental Biology faculty advisor. The department will notify the student and their college of the outcome of the appeal within 15 working days of the quarterly appeal deadline.

See our appeal process for more information.

How to Declare a Major

Students should submit a petition to declare by completing the online declaration petition as soon as they complete the major qualification courses or reach their declaration deadline quarter, whichever comes first.

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for

students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed major qualification courses.

Each major/minor advising office has a process for declaring. To initiate the process to declare, please complete the online declaration petition located on the Department of MCD Biology website. For assistance, please contact MCD biology advising at mcdadvising@ucsc.edu.

Transfer Information and Policy

Transfer and Admission Screening Policy

MCD Biology encourages applications from transfer students in the biological sciences. The department has a major qualification policy that limits access to the program to students who have successfully completed a subset of foundational coursework. Transfer students are held to similar criteria when being assessed for admission to UC Santa Cruz as an MCD-sponsored major. See qualifying for the major as a transfer applicant for more information.

To be considered for admission as a proposed human biology B.S. major, transfer students must complete the following courses or their equivalents prior to transfer, by the end of the spring term for students planning to enter in the fall with grades of C+ or higher in each course.

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1C	General Chemistry	5
CHEM 8A	Organic Chemistry	5
BIOL 20A	Cell and Molecular Biology	5
BIOL 20L	Experimental Biology Laboratory	2
BIOE 20B	Development and Physiology	5

Plus, one of the following calculus courses:

MATH 11A	Calculus with Applications	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5

The CHEM 8A and MATH 11A or MATH 19A requirement will be enforced for transfer students entering in the fall of 2022 and thereafter. BIOL 20L is not required for students who have completed BIOL 20A and BIOE 20B from California community colleges.

In addition, the following courses are recommended prior to transfer to ensure timely graduation.

One of the following courses

MATH 11B	Calculus with Applications	5
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MATH 19B	Calculus for Science, Engineering, and Mathematics	5
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Plus one of the following options

Either this course		
STAT 5	Statistics	5
or these courses		
STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

Plus both of the following courses

CHEM 8B	Organic Chemistry	5
CHEM 8L	Organic Chemistry Laboratory	2

Getting Started at UCSC as a Transfer Student

Transfer students who have met the major qualification requirements are encouraged to declare the major during their first quarter at UC Santa Cruz. Transfer students should complete the required courses in genetics (BIOL 105), biochemistry (BIOL 100) and molecular biology (BIOL 101) by the end of their first year at UCSC since they are prerequisites for the majority of other required courses.

Transfer students should take the Spanish placement exam upon arrival. We encourage transfer students to complete the required Spanish courses (including SPAN 5M) before the fall of their second year.

Letter Grade Policy

All courses that are taken to satisfy any major requirement must be taken for a letter grade.

[Optional Catchall]

Course Substitution Policy

At least half of the upper-division courses required for the major must be taken at UC Santa Cruz, not as transfer credits from another institution. If a student plans to transfer to UCSC from another institution, the student is advised to contact MCD Advising at UCSC before enrolling in upper-division courses at the student's institution or any institution other than UCSC. This advising will help students understand the limitation of transferring upper-division courses from other institutions to UCSC. For more information on transferring courses to UCSC, please consult the undergraduate website.

Once matriculated, a student must receive permission from the department to satisfy the BIOL 20A, BIOL 100, BIOL 105, BIOL 101, or BIOL 110 requirements with courses taken at other institutions. Students who wish to receive credit toward the major for these or other courses

taken either at UCSC or at another institution should contact MCD Advising.

Double Majors and Major/Minor Combinations Policy

Students interested in pursuing multiple majors within the biological sciences may NOT declare the following combination of majors:

- Biology (B.A., B.S., or minor) AND any other biological sciences major
- Any combination of the following: Human Biology, Molecular, Cell and Developmental Biology, Neuroscience, or Biochemistry and Molecular Biology

Should a student choose to double major, they must qualify for and complete the Disciplinary Communication and comprehensive requirements for each of the majors.

Study Abroad

The UC Education Abroad Program (EAP) offers qualified students unique opportunities to broaden their educational horizons. The MCD Biology Department encourages interested students to participate. Many programs are in English-speaking countries or use English for advanced courses. Many programs offer small classes, extensive laboratories, and/or field research experience.

Students interested in study abroad need to get an early start on their basic science requirements, including chemistry, mathematics, and introductory biology and must declare their major prior to applying to go abroad. Students interested in studying abroad should visit the EAP office as soon as possible to begin planning. They should also seek advice about their EAP plan for major courses at UC Santa Cruz from MCD Advising and receive their approval.

Honors

Honors in the majors are awarded to graduating students whose academic performance demonstrates excellence at a grade point average (GPA) of 3.5 or above. Highest honors are awarded to those students whose performance demonstrates the highest level of excellence and results in a GPA of 3.8 or above.

Medical and Professional School Admission

Medical and professional school admissions requirements vary; students should verify that their coursework will satisfy the admissions requirements of the programs to which they plan to apply.

[Optional Catchall]

Requirements and Planners

Course Requirements

Lower-Division Courses

All of the following courses:

BIOL 20A	Cell and Molecular Biology	5
BIOE 20B	Development and Physiology	5
BIOL 20L	Experimental Biology Laboratory	2
CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1M	General Chemistry Laboratory	2
CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2
CHEM 8A	Organic Chemistry	5
CHEM 8L	Organic Chemistry Laboratory	2
CHEM 8B	Organic Chemistry	5
CHEM 8M	Organic Chemistry Laboratory	2

BIOL 20L is waived for junior transfer students.

Note: CHEM 109 is also recommended for pre-med students.

Plus one of the following options:

Either these courses		
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5
or these courses		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

Plus one of the following options:

Either this course		
STAT 5	Statistics	5
or these courses		
STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

Plus one of the following options:

Either these courses

PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 6B or these courses	Introductory Physics II	5
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 6C or these courses	Introductory Physics III	5
PHYS 7A	Elementary Physics I	5
PHYS 7B	Elementary Physics II	5
PHYS 6L	Introductory Physics I Laboratory	1

Note: PHYS 7A/PHYS 7B, and PHYS 6L may not satisfy the physics prerequisite for admission to all medical schools; be sure to check the requirements at all schools where you wish to apply.

Language Requirement:

SPAN 1-SPAN 4 or the equivalent and one quarter of Spanish for health-care workers (SPAN 5M).

Upper-Division Courses

Choose one of the following options:

Either these courses		
BIOL 100	Biochemistry	5
BIOL 101	Molecular Biology	5
or these courses		
BIOC 100A	Biochemistry and Molecular Biology	5
BIOC 100B	Biochemistry and Molecular Biology	5
BIOC 100C	Biochemistry and Molecular Biology	5

Students who complete the BIOC 100A/BIOC 100B/BIOC 100C sequence can use BIOC 100C to satisfy an upper-division elective.

Plus all of the following courses:

BIOL 105	Genetics	5
BIOL 110	Cell Biology	5
BIOL 130	Human Physiology	5
BIOL 130L	Human Physiology Laboratory	2

Internship Requirement:

BIOL 189	Health Sciences Internship	3
BIOL 189W	Disciplinary Communication: Human Biology	3

Electives

At least two upper-division electives chosen from the following (only one of which may be a 3-credit course: BIOL 112, BIOL 116 or BIOL 188).

Note: Lecture/lab combinations count as one course.

BIOC 100C	Biochemistry and Molecular Biology	5
BIOE 133	Exercise Physiology	5
BIOE 133L	Exercise Physiology Laboratory	2
BIOL 111A	Immunology I	5
BIOL 111B	Immunology II	5
BIOL 112	Virology	3
BIOL 114	Cancer Cell Biology	5
BIOL 115	Eukaryotic Molecular Biology	5
BIOL 116	Advanced Topics in Cell Biology	3
BIOL 117	Global Health and Neglected Diseases	5
BIOL 118	Principles of Human Genetics	5
BIOL 120	Developmental Biology	5
BIOL 125	Introduction to Neuroscience	5
BIOL 127	Mechanisms of Neurodegenerative Disease	5
BIOL 140	The RNA World	5
BIOL 188	A Life in Medicine	3
BME 130	Genomes	5
BME 178	Stem Cell Biology	5
CMMU 163	Health Care Inequalities	5
METX 100	Introduction to Microbiology	5
METX 119	Microbiology	5
METX 135	Functional Anatomy	5
METX 135L	Functional Anatomy Lab	2
METX 140	Molecular Biology and Microbial Genetics	5
PHYS 180	Biophysics	5

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division disciplinary communication (DC) requirement. The DC requirement in human biology is satisfied by completing the following courses:

BIOL 130L	Human Physiology Laboratory	2
BIOL 189W	Disciplinary Communication: Human Biology	3

Comprehensive Requirement

All majors have a comprehensive requirement. For the Human Biology B.S., this requirement can be satisfied by receiving a passing grade in the Health Sciences Internship, BIOL 189.

Planners**Sample Human Biology B.S. First-Year Student Four-Year Planner**

Additional first-year student sample planners

	Fall	Winter	Spring
1st (frosh)	CHEM 1A	CHEM 1B & CHEM 1M	CHEM 1C & CHEM 1N
	MATH 11A	MATH 11B	BIOL 20A
2nd (soph)	BIOE 20B	BIOL 100	BIOL 101
	BIOL 20L	CHEM 8B & CHEM 8M	BIOL 105
	CHEM 8A & CHEM 8L		
3rd (junior)	BIOL 110	SPAN 2	
	SPAN 1	PHYS 6A & PHYS 6L	SPAN 3
	STAT 5 or STAT 7 & STAT 7L		PHYS 6B or PHYS 6C
4th (senior)	Upper-division elective	BIOL 130 & BIOL 130L	BIOL 189
	SPAN 4	SPAN 5M	BIOL 189W

The following general education requirements will be fulfilled by the major requirements listed in the above planner: MF, SI, SR, CC. In addition to the GE requirements satisfied by the above courses, a student will also need to complete courses satisfying the ER, IM, TA, PE, and PR general education requirements.

Sample Human Biology B.S. Transfer Two-Year Planner

Additional transfer student sample planners

	Fall	Winter	Spring
3rd (junior)	BIOL 105	BIOL 100	BIOL 101
		PHYS 6A & PHYS 6L	PHYS 6B or PHYS 6CSPAN 3

	SPAN 1	SPAN 2	
4th (senior)	BIOL 110	BIOL 130 & BIOL 130L	Upper-division elective
	Upper-division elective	SPAN 5M	BIOL 189
	SPAN 4		BIOL 189W

This planner assumes that a student has completed all UC Transfer Pathway courses:

- General biology with lab (full introductory sequence) BIOL 20A, BIOE 20B, BIOL 20L
- General chemistry with lab (one-year sequence) CHEM 1A, CHEM 1B & CHEM 1M and CHEM 1C & CHEM 1N
- Calculus for STEM majors (one-year sequence) MATH 11A and MATH 11B
- Organic chemistry (full sequence with lab) CHEM 8A & CHEM 8L and CHEM 8B & CHEM 8M

MOLECULAR, CELL, AND DEVELOPMENTAL BIOLOGY B.S.

Information and Policies**Introduction**

The molecular, cell and developmental (MCD) biology major is designed to prepare students for rigorous graduate programs in biomedical research, medical and other healthcare professional programs, for careers in the biotechnology industry. This major is more structured than the general biology major and requires that students pay careful attention to the prerequisites required for upper-division biology courses. With proper advance planning, a student with virtually any degree can prepare a competitive application for medical school or healthcare professional school. Check our Health Careers webpage for more information on how you can academically prepare for a career in healthcare. Additional information is available at the UC Santa Cruz Career Center.

Academic Advising for the Program

Students should take full advantage of academic advising and should keep in frequent contact with the advisors to stay informed about late announcements of courses, changes in scheduling, and opportunities for special study. Transfer students should also consult the Transfer Information and Policy Section. For additional advice and information:

MCD Advising
389 Thimann Labs
mcdadvising@ucsc.edu

Getting Started in the Major

Prerequisites

Due to the demanding nature of the major, students must begin their science coursework as early as possible. MATH 11A or MATH 19A; CHEM 1A, CHEM 1B, CHEM 1C, and CHEM 8A; and BIOL 20A, BIOE 20B, and BIOL 20L must be completed before the sixth quarter in order for students to qualify for admission to MCD biology-sponsored majors, including the biology B.S., human biology B.S., molecular, cell and developmental biology B.S., and neuroscience B.S. majors. For an overview of prerequisites and getting started in the major, please visit our MCD Biology B.S. website.

An online mathematics placement examination is required to enroll in a math course. Biological science majors are expected to take this examination and are encouraged to work in the learning modules until they place into calculus. For more information see the mathematics placement website.

Program Learning Outcomes

Students who successfully complete the MCD major will be able to:

- demonstrate knowledge of how biochemistry, genetics, and molecular biology are used to elucidate both the function of cells and their organization into tissues;
- recognize that biology has a basis in chemistry, physics, and mathematics;
- describe how scientific method is used to explain natural phenomena;
- use effective oral and written language skills to communicate scientific data and ideas;
- understand safe laboratory practices and perform basic molecular biology techniques;
- generate hypotheses, evaluate data, and design experiments to investigate a scientific problem; and
- present advanced knowledge in the specialized fields of molecular and cell biology.

Major Qualification Policy and Declaration Process

Major Qualification

The Department of Molecular, Cell and Developmental Biology has a qualification policy that applies to the biology B.S., molecular, cell and developmental biology B.S., and neuroscience B.S. majors.

To qualify for any of these majors, students must pass (with a grade of C or better) the following courses or their equivalents:

One of the following courses

MATH 11A	Calculus with Applications	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5

And all of the following courses

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1C	General Chemistry	5
CHEM 8A	Organic Chemistry	5
BIOL 20A	Cell and Molecular Biology	5
BIOE 20B	Development and Physiology	5

And one of the following courses

BIOL 20L	Experimental Biology Laboratory	2
BIOL 102J	Toxic RNA Lab I	5

Appeal Process

Students who are not eligible to declare the major may submit an appeal to the Molecular, Cell and Developmental Biology faculty advisor. The department will notify the student and their college of the outcome of the appeal within 15 working days of the quarterly appeal deadline. See our appeal process for more information.

How to Declare a Major

Students should submit a petition to declare by completing the online declaration petition as soon as they complete the major qualification courses or reach their declaration deadline quarter, whichever comes first.

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed major qualification courses.

Each major/minor advising office has a process for declaring. To initiate the process to declare, please complete the online declaration petition located on the Department of MCD Biology website. For assistance, please contact MCD biology advising at mcdadvising@ucsc.edu.

Transfer Information and Policy

Transfer Admission Screening Policy

MCD Biology encourages applications from transfer students in the biological sciences. The department has a major qualification policy that limits access to the program to students who have successfully completed a

subset of foundational coursework. Transfer students are held to similar criteria when being assessed for admission to UC Santa Cruz as an MCD-sponsored major. See qualifying for the major as a transfer applicant for more information.

To be considered for admission as a proposed molecular, cell and developmental biology B.S. major, transfer students must complete the following courses or their equivalents prior to transfer, by the end of the spring term for students planning to enter in the fall.

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1C	General Chemistry	5
CHEM 8A	Organic Chemistry	5
BIOL 20A	Cell and Molecular Biology	5
BIOL 20L	Experimental Biology Laboratory	2
BIOE 20B	Development and Physiology	5

Plus, one of the following calculus courses:

MATH 11A	Calculus with Applications	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5

The CHEM 8A and MATH 11A or MATH 19A requirement will be enforced for transfer students entering in the fall of 2022 and thereafter. BIOL 20L is not required for students who have completed BIOL 20A and BIOE 20B from California community colleges.

In addition, the following courses are recommended prior to transfer to ensure timely graduation.

One of the following courses

MATH 11B	Calculus with Applications	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

Plus one of the following options

Either this course		
STAT 5	Statistics	5
or these courses		
STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

Plus both of the following courses

CHEM 8B	Organic Chemistry	5
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CHEM 8L	Organic Chemistry Laboratory	2
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Getting Started at UCSC as a Transfer Student

Transfer students who have met the major qualification requirements are encouraged to declare the major during their first quarter at UC Santa Cruz. Transfer students should complete the required courses in genetics (BIOL 105), biochemistry (BIOL 100), and molecular biology (BIOL 101 and BIOL 101L) by the end of their first year at UCSC since they are prerequisites for the majority of other required courses.

Letter Grade Policy

All courses that are taken to satisfy any major requirement must be taken for a letter grade.

[Optional Catchall]

Course Substitution Policy

At least half of the upper-division courses required for the major must be taken at UC Santa Cruz, not as transfer credits from another institution. If a student plans to transfer to UCSC from another institution, the student is advised to contact MCD Advising at UCSC before enrolling in upper-division courses at the student's institution or any institution other than UCSC. This advising will help students understand the limitation of transferring upper-division courses from other institutions to UCSC. For more information on transferring courses to UCSC, please consult the undergraduate website.

Once matriculated, a student must receive permission from the department to satisfy the BIOL 20A, BIOL 100, BIOL 105, BIOL 101 or BIOL 110 requirements with courses taken at other institutions. Students who wish to receive credit toward the major for these or other courses taken either at UCSC or at another institution should contact MCD Advising.

Double Majors and Major/Minor Combinations Policy

Students interested in pursuing multiple majors within the biological sciences may NOT declare the following combination of majors:

- Biology (B.A., B.S., or minor) AND any other biological sciences major
- Any combination of the following: Human Biology, Molecular, Cell and Developmental Biology, Neuroscience, or Biochemistry and Molecular Biology

Should a student choose to double major, they must qualify for and complete the disciplinary communication and comprehensive requirements for each of the majors.

Study Abroad

The UC Education Abroad Program (EAP) offers qualified students unique opportunities to broaden their

educational horizons. The MCD Biology Department encourages interested students to participate. Many programs are in English-speaking countries or use English for advanced courses. Many programs offer small classes, extensive laboratories, and/or field research experience.

Students interested in study abroad need to get an early start on their basic science requirements, including chemistry, mathematics, and introductory biology and must declare their major prior to applying to go abroad. Students interested in studying abroad should visit the EAP office as soon as possible to begin planning. They should also seek advice about their EAP plan for major courses at UC Santa Cruz from MCD Advising and receive their approval.

Honors

Honors in the majors are awarded to graduating students whose academic performance demonstrates excellence at a grade point average (GPA) of 3.5 or above. Highest honors are awarded to those students whose performance demonstrates the highest level of excellence and results in a GPA of 3.8 or above.

Medical and Professional School Admission

Medical and professional school admissions requirements vary; students should verify that their coursework will satisfy the admissions requirements of the programs to which they plan to apply.

[Optional Catchall]

Requirements and Planners

Course Requirements

Lower-Division Courses

One of the following courses

BIOL 20L	Experimental Biology Laboratory	2
BIOL 102J	Toxic RNA Lab I	5

BIOL 20L is waived for junior transfer students.

All of the following courses:

BIOL 20A	Cell and Molecular Biology	5
BIOE 20B	Development and Physiology	5
BIOE 20C	Ecology and Evolution	5
CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2
CHEM 8A	Organic Chemistry	5
CHEM 8L	Organic Chemistry Laboratory	2
CHEM 8B	Organic Chemistry	5

Plus one of the following options:

Either these courses		
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5
or these courses		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

Plus one of the following options

Either this course		
STAT 5	Statistics	5
or these courses		
STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

Plus one of the following options

Either these courses		
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 6B	Introductory Physics II	5
or these courses		
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 6C	Introductory Physics III	5
or these courses		
PHYS 7A	Elementary Physics I	5
PHYS 7B	Elementary Physics II	5
PHYS 6L	Introductory Physics I Laboratory	1

Note: The combination of PHYS 7A/PHYS 7B and PHYS 6L may not satisfy the physics prerequisite for admission to all medical schools; be sure to check the requirements at all schools where you wish to apply.

Upper-Division Courses

Choose one of the following options:

Either these courses		
BIOL 100	Biochemistry	5
BIOL 101	Molecular Biology	5

or these courses		
BIOC 100A	Biochemistry and Molecular Biology	5
BIOC 100B	Biochemistry and Molecular Biology	5
BIOC 100C	Biochemistry and Molecular Biology	5

Students who complete the BIOC 100A/BIOC 100B/BIOC 100C sequence can use BIOC 100C to satisfy an upper-division elective.

Plus one of the following courses:

BIOL 101L	Molecular Biology Laboratory	2
BIOL 102L	Toxic RNA Lab II	5

Plus the following course:

BIOL 104L	Coronavirus Bioinformatics Lab	2
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Plus all of the following courses:

BIOL 105	Genetics	5
BIOL 110	Cell Biology	5

Electives

At least three elective courses from the following list (only one of which may be a 3-credit course: BIOL 112 or BIOL 116):

Note: Lecture/lab combinations count as one course.

BIOL 111A	Immunology I	5
BIOL 111B	Immunology II	5
BIOL 112	Virology	3
BIOL 114	Cancer Cell Biology	5
BIOL 115	Eukaryotic Molecular Biology	5
BIOL 116	Advanced Topics in Cell Biology	3
BIOL 117	Global Health and Neglected Diseases	5
BIOL 118	Principles of Human Genetics	5
BIOL 120	Developmental Biology	5
BIOL 125	Introduction to Neuroscience	5
BIOL 127	Mechanisms of Neurodegenerative Disease	5
BIOL 130	Human Physiology	5
BIOL 140	The RNA World	5
BIOC 100C	Biochemistry and Molecular Biology	5
BIOE 109	Evolution	5
BIOE 135	Plant Physiology	5
BIOE 135L	Plant Physiology Laboratory	2
BIOL 124	Optical Imaging for Biological Research	3
BME 110	Computational Biology Tools	5
BME 130	Genomes	5
BME 160	Research Programming in the Life Sciences	6

BME 178	Stem Cell Biology	5
METX 100	Introduction to Microbiology	5
METX 119	Microbiology	5
METX 140	Molecular Biology and Microbial Genetics	5
PHYS 180	Biophysics	5

One of the following laboratory courses:

BIOL 100L	Biochemistry Laboratory	5
BIOL 103L	Toxic RNA Lab III	5
BIOL 105L	Eukaryotic Genetics Laboratory	5
BIOL 106L	Eukaryotic Genetic Engineering	5
BIOL 108L	Synthetic Gene Regulation Lab III	5
BIOL 109L	Yeast Molecular Genetics Laboratory	5
BIOL 115L	Eukaryotic Molecular Biology Laboratory	5
BIOL 120L	Development Laboratory	5
BIOL 121L	Environmental Phage Biology Laboratory	5
BIOL 186L	Undergraduate Research in MCD Biology	5
METX 119L	Microbiology Laboratory	5

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division disciplinary communication (DC) requirement. The DC requirement in molecular, cell, and developmental biology is satisfied by completing one of the following courses:

BIOL 100L	Biochemistry Laboratory	5
BIOL 103L	Toxic RNA Lab III	5
BIOL 105L	Eukaryotic Genetics Laboratory	5
BIOL 106L	Eukaryotic Genetic Engineering	5
BIOL 108L	Synthetic Gene Regulation Lab III	5
BIOL 109L	Yeast Molecular Genetics Laboratory	5
BIOL 115L	Eukaryotic Molecular Biology Laboratory	5
BIOL 120L	Development Laboratory	5
BIOL 121L	Environmental Phage Biology Laboratory	5
BIOL 186L	Undergraduate Research in MCD Biology	5
METX 119L	Microbiology Laboratory	5

Comprehensive Requirement

All majors have a comprehensive requirement. For the MCD Biology B.S., this requirement can be satisfied by receiving a passing grade in an independent research laboratory:

Choose one of the following courses:

BIOL 100L	Biochemistry Laboratory	5
BIOL 103L	Toxic RNA Lab III	5
BIOL 105L	Eukaryotic Genetics Laboratory	5
BIOL 106L	Eukaryotic Genetic Engineering	5
BIOL 108L	Synthetic Gene Regulation Lab III	5
BIOL 109L	Yeast Molecular Genetics Laboratory	5
BIOL 115L	Eukaryotic Molecular Biology Laboratory	5
BIOL 120L	Development Laboratory	5
BIOL 121L	Environmental Phage Biology Laboratory	5
BIOL 186L	Undergraduate Research in MCD Biology	5
METX 119L	Microbiology Laboratory	5

Planners

Sample First-Year Four-Year Planner

Additional first-year sample planners

	Fall	Winter	Spring
1st (frosh)	CHEM 1A	CHEM 1B	CHEM 1C & CHEM 1N
	MATH 11A	MATH 11B	BIOL 20A
2nd (soph)	BIOE 20B	BIOL 100	BIOL 101
	BIOL 20L	CHEM 8B	BIOL 101L
	CHEM 8A & CHEM 8L		BIOL 105
3rd (jr)	BIOL 110	Upper-division elective	Upper-division elective
	STAT 5 or; STAT 7 & STAT 7L	PHYS 6A & PHYS 6L	PHYS 6B or PHYS 6C
4th (sr)	Upper-division elective	Lab	
	BIOE 20C		

The following general education requirements will be fulfilled by the major requirements listed in the above planner: MF, SI, and SR. In addition to the general

education requirements satisfied by the above courses, a student will also need to complete courses satisfying the CC, ER, IM, TA, PE, and PR general education requirements.

Sample Transfer Two-Year Planner

Additional transfer student sample planners

	Fall	Winter	Spring
3rd (jr)	BIOL 105	BIOL 100	BIOL 101
	PHYS 6A & PHYS 6L	PHYS 6B or PHYS 6C	BIOL 101L
4th (sr)	BIOL 110	Upper-division elective	Upper-division elective
	Upper-division elective	Lab	

This planner assumes that a student has completed all UC Transfer Pathway courses

- General biology with lab (full introductory sequence) BIOL 20A, BIOE 20B, BIOL 20L, BIOE 20C
- General chemistry with lab (one-year sequence) CHEM 1A, CHEM 1B & CHEM 1M and CHEM 1C & CHEM 1N
- Calculus for STEM majors (one-year sequence) MATH 11A and MATH 11B
- Organic chemistry (full sequence with lab) CHEM 8A & CHEM 8L and CHEM 8B

NEUROSCIENCE B.S.

Information and Policies

Introduction

Neuroscience, the study of the nervous system and behavior of animals, is a frontier area in biology, touching psychology on the one hand and computer science on the other. The neuroscience major provides students with rigorous preparation for graduate studies and research in the field of neuroscience. With proper advance planning, a student with virtually any degree can prepare a competitive application for medical school or health care professional school. Check our Health Careers webpage for more information on how you can academically prepare for a career in healthcare. Additional information is available at the UC Santa Cruz Career Center.

Academic Advising for the Program

Students should take full advantage of academic advising and should keep in frequent contact with the advisors to stay informed about late announcements of courses, changes in scheduling, and opportunities for special study. Transfer students should also consult the Transfer Information and Policy Section. For additional advice and information:

MCD Advising
389 Thimann Labs
mcdadvising@ucsc.edu

Getting Started in the Major

Prerequisites

Due to the demanding nature of the major, students must begin their science coursework as early as possible. MATH 11A or MATH 19A; CHEM 1A, CHEM 1B, CHEM 1C, and CHEM 8A; and BIOL 20A, BIOE 20B, and BIOL 20L must be completed before the sixth quarter in order for students to qualify for admission to MCD Biology-sponsored majors, including the biology B.S., human biology B.S., molecular, cell and developmental biology B.S., and neuroscience B.S. majors. For an overview of prerequisites and getting started in the major, please visit our Neuroscience B.S. site.

An online mathematics placement examination is required to enroll in a math course. Biological science majors are expected to take this examination and are encouraged to work in the learning modules until they place into calculus. For more information see the mathematics placement website.

Program Learning Outcomes

Students who successfully complete the Neuroscience major will be able to:

- Demonstrate knowledge of how biochemistry, genetics, and molecular biology are used to elucidate both the function of cells and their organization into tissues.
- Recognize that biology has a basis in chemistry, physics, and mathematics.
- Describe how scientific method is used to explain natural phenomena.
- Use effective oral and written language skills to communicate scientific data and ideas.
- Understand safe laboratory practices and perform basic molecular biology techniques.
- Generate hypotheses, evaluate data, and design experiments to investigate a scientific problem.
- Present advanced knowledge in the specialized field of neuroscience.

Major Qualification Policy and Declaration

Process

Major Qualification

The Department of Molecular Cell and Developmental Biology has a qualification policy that applies to the biology B.S., molecular, cell and developmental biology B.S., and neuroscience B.S. majors.

To qualify for any of these majors, students must pass (with a grade of C or better) the following courses or their equivalents:

One of the following courses

MATH 11A	Calculus with Applications	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5

And all of the following courses

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1C	General Chemistry	5
CHEM 8A	Organic Chemistry	5
BIOL 20A	Cell and Molecular Biology	5
BIOE 20B	Development and Physiology	5

and one of the following courses

BIOL 20L	Experimental Biology Laboratory	2
BIOL 102J	Toxic RNA Lab I	5

Appeal Process

Students who are not eligible to declare the major may submit an appeal to the MCD Biology faculty advisor. The department will notify the student and their college of the outcome of the appeal within 15 working days of the quarterly appeal deadline. See our appeal process for more information.

How to Declare a Major

Students should submit a petition to declare by completing the online declaration petition as soon as they complete the major qualification courses or reach their declaration deadline quarter, whichever comes first.

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed major qualification courses.

Each major/minor advising office has a process for declaring. To initiate the process to declare, please complete the online declaration petition located on the Department of MCD Biology website. For assistance, please contact MCD biology advising at mcdadvising@ucsc.edu.

Transfer Information and Policy**Transfer Admission Screening Policy**

MCD Biology encourages applications from transfer students in the biological sciences. The department has a major qualification policy that limits access to the program to students who have successfully completed a subset of foundational coursework. Transfer students are held to similar criteria when being assessed for admission to UC Santa Cruz as an MCD-sponsored major. See qualifying for the major as a transfer applicant for more information.

To be considered for admission as a proposed neuroscience B.S. major, transfer students must complete the following courses or their equivalents prior to transfer by the end of the spring term for students planning to enter in the fall.

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1C	General Chemistry	5
CHEM 8A	Organic Chemistry	5
BIOL 20A	Cell and Molecular Biology	5
BIOL 20L	Experimental Biology Laboratory	2
BIOE 20B	Development and Physiology	5

Plus one of the following calculus courses:

MATH 11A	Calculus with Applications	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5

The CHEM 8A and MATH 11A or MATH 19A requirement will be enforced for transfer students entering in the fall of 2022 and thereafter. BIOL 20L is not required for students who have completed BIOL 20A and BIOE 20B from California community colleges.

In addition, the following courses are recommended prior to transfer to ensure timely graduation.

Either these courses		
MATH 11B	Calculus with Applications	5
OR		
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
AND		
PHYS 6A	Introductory Physics I	5
AND		
PHYS 6C	Introductory Physics III	5
AND		
PHYS 6L	Introductory Physics I Laboratory	1
AND		
STAT 5	Statistics	5

or these courses		
STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
AND		
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2
AND		
CHEM 8B	Organic Chemistry	5
CHEM 8L	Organic Chemistry Laboratory	2

Getting Started at UCSC as a Transfer Student

Transfer students who have met the major qualification requirements are encouraged to declare the major immediately during their first quarter at UC Santa Cruz. Transfer students should complete the required courses in genetics (BIOL 105), biochemistry (BIOL 100), and molecular biology (BIOL 101 and BIOL 101L) by the end of their first year at UCSC since they are prerequisites for the majority of other required courses.

Letter Grade Policy

All courses that are taken to satisfy any major requirement must be taken for a letter grade.

[Optional Catchall]**Course Substitution Policy**

At least half of the upper-division courses required for the major must be taken at UC Santa Cruz, not as transfer credits from another institution. If a student plans to transfer to UCSC from another institution, the student is advised to contact MCD Advising at UCSC before enrolling in upper-division courses at the student's institution or any institution other than UCSC. This advising will help students understand the limitation of transferring upper-division courses from other institutions to UCSC. For more information on transferring courses to UCSC, please consult the undergraduate website.

Once matriculated, a student must receive permission from the department to satisfy the BIOL 20A, BIOL 100, BIOL 105, BIOL 101 or BIOL 110 requirements with courses taken at other institutions. Students who wish to receive credit toward the major for these or other courses taken either at UCSC or at another institution should contact MCD Advising.

Double Majors and Major/Minor Combinations Policy

Students interested in pursuing multiple majors within the biological sciences may NOT declare the following combination of majors:

- Biology (B.A., B.S., or minor) AND any other biological sciences major

- Any combination of the following: Human Biology, Molecular, Cell and Developmental Biology, Neuroscience, or Biochemistry and Molecular Biology

Should a student choose to double major, they must qualify for and complete the disciplinary communication and comprehensive requirements for each of the majors.

Study Abroad

The UC Education Abroad Program (EAP) offers qualified students unique opportunities to broaden their educational horizons. The MCD Biology Department encourages interested students to participate. Many programs are in English-speaking countries or use English for advanced courses. Many programs offer small classes, extensive laboratories, and/or field research experience.

Students interested in study abroad need to get an early start on their basic science requirements, including chemistry, mathematics, and introductory biology and must declare their major prior to applying to go abroad. Students interested in studying abroad should visit the EAP office as soon as possible to begin planning. They should also seek advice about their EAP plan for major courses at UC Santa Cruz from MCD Advising.

Honors

Honors in the majors are awarded to graduating students whose academic performance demonstrates excellence at a grade point average (GPA) of 3.5 or above. Highest honors are awarded to those students whose performance demonstrates the highest level of excellence and results in a GPA of 3.8 or above.

Medical and Professional School Admission

Medical and professional school admissions requirements vary; students should verify that their coursework will satisfy the admissions requirements of the programs to which they plan to apply.

[Optional Catchall]

Requirements and Planners

Course Requirements

Lower-Division Courses

Students choose one of the following courses

BIOL 20L	Experimental Biology Laboratory	2
BIOL 102J	Toxic RNA Lab I	5

and all of the following courses:

BIOL 20A	Cell and Molecular Biology	5
BIOE 20B	Development and Physiology	5
CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5

CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2
CHEM 8A	Organic Chemistry	5
CHEM 8L	Organic Chemistry Laboratory	2
CHEM 8B	Organic Chemistry	5

BIOL 20L is waived for junior transfer students

Plus one of the following options:

Either these courses		
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5
or these courses		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

Plus one of the following options:

Either this course		
STAT 5	Statistics	5
or these courses		
STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

Plus one of the following options:

Either these courses		
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 6C	Introductory Physics III	5
or these courses		
PHYS 7A	Elementary Physics I	5
PHYS 7B	Elementary Physics II	5
PHYS 6L	Introductory Physics I Laboratory	1

Note: The combination of PHYS 7A/PHYS 7B and PHYS 6L may not satisfy the physics prerequisite for admission to all medical schools; be sure to check the requirements at all schools where you wish to apply.

Upper-Division Courses

Choose one of the following options:

Either these courses

BIOL 100	Biochemistry	5
BIOL 101 or these courses	Molecular Biology	5
BIOC 100A	Biochemistry and Molecular Biology	5
BIOC 100B	Biochemistry and Molecular Biology	5
BIOC 100C	Biochemistry and Molecular Biology	5

Students who complete the BIOC 100A/BIOC 100B/BIOC 100C sequence can use BIOC 100C to satisfy an upper-division elective.

Plus one of the following courses:

BIOL 101L	Molecular Biology Laboratory	2
BIOL 102L	Toxic RNA Lab II	5

Plus all of the following courses:

BIOL 105	Genetics	5
BIOL 125	Introduction to Neuroscience	5
BIOL 126	Advanced Molecular Neuroscience	5
BIOL 128	Developmental Neurobiology	5

Electives

Students must complete additional upper-division electives chosen from the courses below and one additional laboratory course.

One of the following electives:

NOTE: Lecture/lab combinations count as one course.

BIOE 131	Animal Physiology	5
BIOE 131L	Animal Physiology Laboratory	2
BIOL 110	Cell Biology	5
BIOL 114	Cancer Cell Biology	5
BIOL 115	Eukaryotic Molecular Biology	5
BIOL 118	Principles of Human Genetics	5
BIOC 100C	Biochemistry and Molecular Biology	5
BME 110	Computational Biology Tools	5
BME 130	Genomes	5
BME 160	Research Programming in the Life Sciences	6
PHYS 180	Biophysics	5
PSYC 121	Perception	5
PSYC 123	Cognitive Neuroscience	5

The following laboratory course:

BIOL 129L	Neurobiology Lab	5
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One of the following courses:

BIOL 129A	Advanced Topics in System Neuroscience	5
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BIOL 129B	Advanced Topics in Developmental Neurobiology	5
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Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division disciplinary communication (DC) requirement. The DC requirement in neuroscience is satisfied by completing the following course:

BIOL 129L	Neurobiology Lab	5
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Comprehensive Requirement

All majors require a comprehensive requirement. For the neuroscience B.S., this requirement can be satisfied by receiving a passing grade in the following laboratory course.

BIOL 129L	Neurobiology Lab	5
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Planners

Sample First-Year Student Four-Year Planner

Additional first-year student sample planners

	Fall	Winter	Spring
1st (frosh)	CHEM 1A	CHEM 1B	CHEM 1C & CHEM 1N
	MATH 11A	MATH 11B	BIOL 20A
2nd (soph)	BIOE 20B	BIOL 105	CHEM 8B
	BIOL 20L	CHEM 8A & CHEM 8L	PHYS 6A & PHYS 6L
	STAT 5 or STAT 7 & STAT 7L		
3rd (junior)	BIOL 100	BIOL 101 & BIOL 101L	Upper-division elective
	PHYS 6C	BIOL 125	
4th (senior)		BIOL 126	BIOL 129A or B
		BIOL 128	Upper-division elective
		BIOL 129L	

The following general education requirements will be fulfilled by the major requirements listed in the above planner: MF, SI, and SR. In addition to the GE requirements satisfied by the above courses, a student will also need to complete courses satisfying the CC, ER, IM, TA, PE, and PR general education requirements.

Sample Transfer Two-Year Planner

Additional transfer student sample planners

	Fall	Winter	Spring
3rd (junior)	BIOL 100 PHYS 6A & 6L	BIOL 105	BIOL 101 & BIOL 101L PHYS 6C
4th (senior)	BIOL 125	BIOL 126 BIOL 128 BIOL 129L	BIOL 129A or BIOL 129B Upper-division elective

This planner assumes that a student has completed all UC Transfer Pathway courses:

- General biology with lab (full introductory sequence) BIOL 20A, BIOE 20B, BIOL 20L, BIOE 20C
- General chemistry with lab (one-year sequence) CHEM 1A, CHEM 1B & CHEM 1M and CHEM 1C & CHEM 1N
- Calculus for STEM majors (one-year sequence) MATH 11A and MATH 11B
- Organic chemistry (full sequence with lab) CHEM 8A & CHEM 8L and CHEM 8B

BIOLOGY MINOR

The biology minor is designed to incorporate elements of both the ecology and evolutionary biology discipline and the molecular, cell and developmental biology discipline.

Course Requirements

Lower-Division Courses

All of the following courses:

BIOL 20A	Cell and Molecular Biology	5
BIOE 20B	Development and Physiology	5
BIOL 20L	Experimental Biology Laboratory	2
BIOE 20C	Ecology and Evolution	5

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1C	General Chemistry	5
CHEM 8A	Organic Chemistry	5

Upper-Division Courses

All of the following courses:

BIOL 100	Biochemistry	5
BIOL 105	Genetics	5
BIOE 107	Ecology	5
BIOE 109	Evolution	5

Students must complete one upper-division biology elective (5-7 credits) chosen from Biological Sciences-EEB courses (BIOE) or Biological Sciences-MCDB courses (BIOL) numbered 100-181.

There is no senior comprehensive requirement for the biology minor. Please contact Molecular, Cell and Developmental Biology undergraduate advisors for further information.

MOLECULAR, CELL AND DEVELOPMENTAL BIOLOGY M.S.

Introduction

Students apply to the master's degree program through the same portal as for the Ph.D. degree program. While the M.S. is research intensive, master's students do not do research rotations; they must identify a research advisor prior to the training period. Students are required to participate in laboratory research meetings and departmental seminar series every quarter.

Requirements

Course Requirements

Complete the graduate core course:

BIOL 200A	Critical Analysis of Scientific Literature	5
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BIOL 200A to be completed in the first year.

And the following courses:

BIOL 288	Pedagogy in STEM	2
BIOL 289	Practice of Science	5

Enroll in the following seminar series each quarter:

BIOL 291	Molecular, Cellular, and Developmental Biology Seminar	2
BIOL 292	MCD Seminar	

Approved Graduate Electives

(M.S. students must complete two electives)

Note: Lecture/lab combinations count as one course. For BME 163 and BME 263, only one of these courses will be counted toward fulfillment of the electives.

BIOL 200E	Experimental Design	3	METX 210	Molecular and Cellular Basis of Bacterial Pathogenesis	5
BIOL 200F	Logic and Approaches to Scientific Discovery	5	METX 238	Pathogenesis: Molecular Mechanisms of Disease PDP, Training in teaching offered by the Institute for Scientist and Engineer Educators (ISEE)	5
BIOL 201	RNA Processing	5	STAT 108	Linear Regression	5
BIOL 203	Ribosomes and Translation	5	STAT 202	Linear Models in SAS	5
BIOL 204	Chromatin	5	STAT 205B	Intermediate Classical Inference	5
BIOL 205	Epigenetics	5	STAT 266A	Data Visualization and Statistical Programming in R	3
BIOL 206	Introduction to Stem Cell Biology	5			
BIOL 206L	Current Protocols in Stem Cell Biology	5			
BIOL 215	Applied Statistics for Molecular, Cell, and Developmental Biology	5			
BIOL 208	Cellular Signaling Mechanisms	5			
BIOL 214	Advances in Cancer Biology	5			
BIOL 217	Influence of Environment and Experience on Brain Development	5			
BIOL 218	CRISPR/Cas Technologies	5			
BIOL 226	Advanced Molecular Neuroscience	5			
BIOL 228	Developmental Neurobiology	5			
BIOL 290	Career Planning	2			
BME 110	Computational Biology Tools	5			
BME 130	Genomes	5			
BME 163	Applied Visualization and Analysis of Scientific Data	3			
BME 160	Research Programming in the Life Sciences	6			
BME 263	Applied Visualization and Analysis of Scientific Data	5			
BME 205	Bioinformatics Models and Algorithms	5			
BME 229	Protein and Cell Engineering	5			
BME 237	Applied RNA Bioinformatics	5			
CHEM 200A	Advanced Biochemistry: Biophysical Methods	5			
CHEM 200B	Advanced Biochemistry: Macromolecular Structure and Function	5			
CHEM 200C	Advanced Biochemistry: Enzyme Mechanisms and Kinetics	5			
CHEM 230	Grant Writing in Biomedical Research	5			
ECE 236	Optics and Microscopy	5			
ECE 237	Image Processing and Reconstruction	5			
METX 202	Cell and Molecular Toxicology	5			
METX 206A	Advanced Microbiology	5			

Students who have had no or very little education in statistics should audit or take STAT 7 (5 credits) and perhaps also STAT 7L (2 credits) to learn basic statistical methodologies, before taking one of the graduate level courses.

Students who take BIOL 290, Career Planning, take CHEM 230, Grant Writing, and/or participate in the Professional Development Program (PDP) may count only one of those as an advanced graduate elective.

Students may count either ECE 236 or ECE 237 but not both toward their advanced graduate electives.

Other Requirements

Write a master's thesis based on original research (a scholarly dissertation of the literature and progress on research project; a peer-reviewed publication is not required for graduation).

Present a thesis defense in a departmental seminar. The student will present their research project in a public venue such as a departmental seminar or one of the research clubs (RNA club, chromatin club, neuro club, etc.).

[Optional Catchall]

Applying for Graduation

MOLECULAR, CELL AND DEVELOPMENTAL BIOLOGY PH.D.

Introduction

The program in Molecular, Cell, and Developmental (MCD) biology (courses BIOL) leads to the doctor of philosophy (Ph.D.) and is designed to prepare students for careers in research, teaching, and biotechnology. Current research in MCD biology focuses on such topics as the structure and function of RNA, gene expression, chromatin structure, epigenetics, cell signaling, cell division, development, nerve cell function, and stem cell biology.

Advancement to Candidacy**Course Requirements**

Ph.D. students complete the graduate core courses, BIOL 200A, BIOL 200E, and BIOL 200F, along with BIOL 215, BIOL 288, and BIOL 289 (ethics) in the first year. Students are required to participate in laboratory research meetings and departmental seminar series (BIOL 291/BIOL 292) every quarter. First-year rotating Ph.D. students complete three six-week laboratory rotations. Students choose their rotation laboratories in consultation with the Graduate Advisory Committee. The laboratory rotations give students a chance to learn about the diverse fields and methods of inquiry and to interact with members of the department. At the end of each rotation, students present a short talk or present a poster to the department on their rotation project. At the end of winter quarter, students consult with rotation faculty to identify a permanent thesis laboratory.

Ph.D. students must take two approved advanced graduate electives, in addition to the core courses.

Complete the graduate core courses:

BIOL 200A	Critical Analysis of Scientific Literature	5
BIOL 200E	Experimental Design	3
BIOL 200F	Logic and Approaches to Scientific Discovery	5

Plus the following courses:

BIOL 215	Applied Statistics for Molecular, Cell, and Developmental Biology	5
BIOL 288	Pedagogy in STEM	2
BIOL 289	Practice of Science	5

Enroll in the following seminar series each quarter:

BIOL 291	Molecular, Cellular, and Developmental Biology Seminar	2
BIOL 292	MCD Seminar	

Approved Graduate Electives

(Ph.D. students complete two)

Note: Lecture and lab combinations count as a single course. For BME 163 and BME 263, only one of these courses will be counted toward fulfillment of the electives.

BIOL 201	RNA Processing	5
BIOL 203	Ribosomes and Translation	5
BIOL 204	Chromatin	5
BIOL 205	Epigenetics	5
BIOL 206	Introduction to Stem Cell Biology	5
BIOL 206L	Current Protocols in Stem Cell Biology	5
BIOL 208	Cellular Signaling Mechanisms	5

BIOL 214	Advances in Cancer Biology	5
BIOL 217	Influence of Environment and Experience on Brain Development	5
BIOL 218	CRISPR/Cas Technologies	5
BIOL 226	Advanced Molecular Neuroscience	5
BIOL 228	Developmental Neurobiology	5
BIOL 290	Career Planning	2
BME 110	Computational Biology Tools	5
BME 130	Genomes	5
BME 160	Research Programming in the Life Sciences	6
BME 163	Applied Visualization and Analysis of Scientific Data	3
BME 205	Bioinformatics Models and Algorithms	5
BME 229	Protein and Cell Engineering	5
BME 237	Applied RNA Bioinformatics	5
BME 263	Applied Visualization and Analysis of Scientific Data	5
CHEM 200A	Advanced Biochemistry: Biophysical Methods	5
CHEM 200B	Advanced Biochemistry: Macromolecular Structure and Function	5
CHEM 200C	Advanced Biochemistry: Enzyme Mechanisms and Kinetics	5
CHEM 230	Grant Writing in Biomedical Research	5
ECE 236	Optics and Microscopy	5
ECE 237	Image Processing and Reconstruction	5
METX 202	Cell and Molecular Toxicology	5
METX 210	Molecular and Cellular Basis of Bacterial Pathogenesis	5
METX 206A	Advanced Microbiology	5
METX 238	Pathogenesis: Molecular Mechanisms of Disease	5
STAT 108	Linear Regression	5
STAT 202	Linear Models in SAS	5
STAT 205B	Intermediate Classical Inference	5
STAT 266A	Data Visualization and Statistical Programming in R	3

* Students who have had no or very little statistics should audit or take STAT 7 (5 credits) and perhaps also STAT

7L (2 credits) to learn the basics, before taking one of the graduate level courses.

** Students who take BIOL 290: Career Planning, take CHEM 230: Grant Writing, and/or participate in the professional development program (PDP) may count only one of those as an advanced graduate elective.

*** Students may count either ECE 236 or ECE 237 but not both toward their advanced graduate electives.

Foreign Language Requirements

Teaching Requirement

Complete two quarters of service as a teaching assistant.

Pre-Qualifying Requirements

Qualifying Examination

Complete an oral and written qualifying examination.

Second-year Ph.D. students are required to submit a written proposal on their thesis research. The oral component of the qualifying examination, taken in spring quarter of the second year, is an oral examination on the proposal. The examining committee is comprised of three internal reviewers and one external reviewer.

Post-Qualifying Requirements

Advancement to Candidacy

Advancement to candidacy occurs by the end of the third year (nine quarters). Students must give a full research seminar (45-50-minute talk followed by questions) in an MCD seminar slot. This should be attended and evaluated by the Thesis Advisory Committee. A passing evaluation requires demonstration of a good understanding of their project and background knowledge, and a clear presentation of their questions or hypotheses, tests of those, and progress to date. A passing evaluation leads to advancement to candidacy. Students have an additional three years (nine quarters) to complete their degree within normative time.

Dissertation

Dissertation

Meet yearly, starting in the second year of study, with the student's thesis committee.

Complete thesis research resulting in peer-reviewed publications and a dissertation on original and significant work.

Once the qualifying examination is passed and prior to their department seminar, a student, with their faculty advisor, selects a thesis committee to help guide the student's thesis research. This committee monitors the student's progress and ultimately approves the final draft of the student's dissertation. The student must meet with the thesis committee at least once a year after passing the qualifying examination.

Dissertation Defense

Present the thesis defense in a departmental seminar.

Academic Progress

Applying for Graduation

[Optional Catchall]

Ocean Sciences

A312 Earth and Marine Sciences Building
(831) 459-4730
<https://oceansci.ucsc.edu/>

PROGRAMS OFFERED

Ocean Sciences M.S. Plan 1 and Plan 2 (p. 381)

Ocean Sciences Ph.D. (p. 382)

OTHER PROGRAMS OF INTEREST

Environmental Sciences B.S. (p. 282)

Ecology and Evolution B.S. (p. 302)

Marine Biology B.S. (p. 310)

Earth Sciences B.S. (p. 265)

The Ocean Sciences Department includes faculty, students, and staff involved in oceanography and other marine sciences and offers undergraduate and graduate courses in these disciplines. Through faculty sponsors, students have access to a wide variety of research facilities and equipment, including on-campus analytical chemistry, geology, and molecular biology laboratories for marine research; computing and imaging facilities; an onshore marine laboratory two miles from campus (Long Marine Laboratory), with aquariums and holding tanks that are supplied with running sea water; and a unique field station on Año Nuevo Island Reserve (19 miles north of Santa Cruz), especially suited for studies on pinnipeds and marine birds. The department supports collaborative studies utilizing the innovative technologies of the nearby Monterey Bay Aquarium Research Institute (MBARI), the Naval Postgraduate School, Stanford University's Hopkins Marine Station, California State University (CSU) Moss Landing Laboratory, and other facilities. Students may also work at other University of California facilities, including the Bodega Marine Laboratories and Scripps Institute of Oceanography.

In addition to research and instructional activities along the California coast, interests of the core faculty and their students include biological, chemical, and physical oceanography; sediment, marine, organic, and trace metal biogeochemistry; marine plankton, phytoplankton ecology, paleoceanography, aquatic microbial ecology,

ecological modeling, and remote sensing (satellite oceanography); numeric modeling of coastal and basin-scale dynamics; and midwater ecology, climatology, among others.

Ocean Sciences Department affiliated faculty in other departments represent a deep resource of research interests and methodologies including those pertaining to coral reef and kelp forest ecology, plate tectonics and continental margins, marine mammal behavior and physiology, and natural products from marine organisms. Student research projects have included participation in major scientific expeditions to various marine environments ranging from Polar Regions to the tropics.

UNDERGRADUATE PROGRAM

While offering a range of undergraduate courses, the Ocean Sciences Department presently only confers graduate degrees (Master of Science—M.S. or Doctor of Philosophy—Ph.D.) However, the undergraduate major in environmental science includes required and elective courses in ocean sciences. In addition, the undergraduate major in marine biology, sponsored by the Biological Sciences departments, includes required and elective courses in ocean sciences, and includes an ocean sciences concentration in Earth sciences for undergraduates. Students interested in ocean sciences should major in a discipline such as biology, marine biology, chemistry, Earth sciences, physics, or mathematics and take ocean sciences-related electives. Students with a bachelor's degree in one of these disciplines or equivalent coursework may apply directly for admission to the graduate program through the Division of Graduate Studies.

GRADUATE PROGRAM

Our graduate education mission is to train the next generation of talented and diverse ocean scientists. Through core training in oceanography and focused advanced training in biology, chemistry, Earth sciences, physics, and data science we prepare students to tackle the pressing issues facing society today. Ocean sciences is a highly interdisciplinary field that requires diversity in thinking and experience. We welcome and provide support for students with diverse backgrounds such as URM, LGBTQ, and first-generation college students. From faculty training to peer mentoring and other programmatic elements we are dedicated to fostering the success of all students in our program.

The Ocean Sciences Department offers both master of science and doctorate degree programs. The graduate programs in ocean sciences are designed to prepare students for careers in research, teaching, and other environmentally related endeavors. The graduate programs encourage collaborative and interdisciplinary approaches, and are designed to support and promote diversity, equity and inclusion. There are professional development events and opportunities such as an annual career panel, several designated emphasis degrees that

can be combined with the ocean sciences graduate degrees, and training in innovative and inclusive teaching. There is an advising structure that provides support from a main advisor, thesis committee members, an advisory committee, and peers. A student-run group, Communicating Oceanographic Research Effectively (CORE), offers community building activities.

The fundamental requirement for admission to the program is substantial evidence of superior scholarship and aptitude for original research. Preparation for admission to the graduate program in ocean sciences should comprise an undergraduate degree in the discipline of one of the program specialty areas (e.g., biology or marine biology, geology or earth sciences, chemistry, or physical science) or an equivalent background. If a student does not have a degree in one of these areas, the student must demonstrate that they have taken the classes necessary to do their research.

The prerequisites for entering either the master's or the Ph.D. programs are a minimum of two quarters or two semesters in each of the following: a calculus series; chemistry, biology, and physics. In addition, one course in each of the following is required: earth sciences or geological principles; and statistics or biostatistics.

Details regarding admission, graduate standing, financial aid, examinations, and the requirements for the master of science and doctor of philosophy degrees are available from the Division of Graduate Studies.

OCEAN SCIENCES M.S.

Introduction

The Ocean Sciences Department offers a master of science (M.S.) degree in ocean sciences. The ocean sciences M.S. degree can be attained through plan I: thesis (coursework and thesis, minimum 42 credits), or plan II: examination (coursework and comprehensive examination, minimum 40 credits). The degree combines core courses and electives to provide depth and breadth in the ocean sciences. Graduates from the program are exceptionally prepared to take research or management positions in organizations concerned with the marine environment, to become educators, or to enter doctoral programs in ocean sciences or related fields. The thesis M.S. degree is preparation for research careers.

Whereas the doctoral program has an oceanographic orientation, the ocean sciences master's program is even broader and has traditionally attracted many students in marine biology and ecology. Students are encouraged to select a course of study that draws on the expertise of the core ocean sciences faculty and any of the affiliated faculty in other departments. Customized programs of study that combine related disciplines are supported in the master's program.

Requirements

Course Requirements

To introduce students to the breadth and depth of the field of ocean sciences, students will be required to complete the following:

Plan I: M.S. (thesis) requirements:

OCEA 200 (Physical Oceanography) and any two of the remaining three core courses. Students are expected to complete all three of these courses in the first year of the program, and they should be taken in the order listed below. Students are also encouraged to take the fourth core course, in which case it can count as an elective.

The core ocean sciences courses are expected to be completed in the first year

OCEA 200	Physical Oceanography	5
OCEA 220	Chemical Oceanography	5
OCEA 230	Biological Oceanography	5
OCEA 280	Marine Geology	5

Two graduate-level or upper-division electives

A minimum of two graduate-level or upper-division elective courses to provide depth in the chosen area of emphasis, one of which must be a 5-credit graduate-level course in statistics/data analysis, such as OCEA 260 (Introductory Data Analysis in the Ocean and Earth Sciences) or OCEA 267 (Applied Environmental Time Series Analysis). They are chosen in consultation with the student's advisor and the department's graduate advising committee. A maximum of one course may be a graduate-level seminar (e.g. OCEA 290).

Minimum of three courses in independent studies

A minimum of three courses in independent studies under the direction of an advisor, is required. Each quarter a student should take 15 credits of classes. Students beyond their first year will usually take 10 or 15 credits of Independent Studies each quarter.

OCEA 297	Independent Study
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The following course is taken prior to or concurrent with being a teaching assistant.

OCEA 296	Teaching in Ocean Sciences	2
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This course is generally offered during the fall quarter each year.

Attendance in the following course is required each quarter of enrollment.

OCEA 292	Seminar
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Plan II: M.S. (examination) requirements:

Completion of the four core ocean sciences courses is required.

The four core ocean sciences courses are required to be completed.

OCEA 200	Physical Oceanography	5
OCEA 220	Chemical Oceanography	5

OCEA 230	Biological Oceanography	5
OCEA 280	Marine Geology	5

Four graduate-level or upper-division elective courses

A minimum of four graduate-level or upper-division elective courses is required to provide depth in the chosen area of emphasis or supporting disciplines, one of which must be a 5-credit graduate-level course in statistics/data analysis, such as OCEA 260 (Introductory Data Analysis in the Ocean and Earth Sciences) or OCEA 267 (Applied Environmental Time Series Analysis). These courses are selected in consultation with the student's advisor and the department's graduate advising committee (Plan I and II). A maximum of one course may be a graduate-level seminar (OCEA 290), and at least two courses must be graduate or upper-division undergraduate lecture courses.

Attendance in the following course is required each quarter of enrollment.

OCEA 292	Seminar
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Other Requirements for Plan I: M.S. (thesis)

Plan I M.S. students must complete an M.S. thesis and must make a public presentation of their thesis before the deadline in which all degree requirements are to be completed within the term of receiving the degree. In addition, the M.S. thesis satisfying all format and content requirements must be submitted to the Graduate Division before the deadline in which all degree requirements are to be completed within the term of receiving the degree.

Other Requirements for Plan II: M.S. (examination)

Plan II M.S. students must take and pass a comprehensive exam that covers the material from the core courses.

Applying for Graduation

Once requirements for the degree have been met, including approval from their academic advisor and the Ocean Sciences Department, M.S. students may apply for the degree by the deadline for the quarter in which they would like to receive their degree. Deadlines are published in the Academic and Administrative Calendar each year.

OCEAN SCIENCES PH.D.**Introduction**

The program leading to a doctorate in ocean sciences is designed around a core training in oceanography for all students, supplemented and focused by advanced training in oceanography and in the traditional disciplines—biology, chemistry, Earth sciences, and physics—as chosen by the student and his or her advisers. The core training is provided through courses in ocean sciences; a subset of which is taken by all students in the first two

years and reinforced by the student's seminars throughout the program. Preparation also includes upper-division/graduate courses in ocean sciences and in the specialty discipline, graduate seminars, independent study research credits, participation in a departmental student seminar series, and a minimum requirement of two quarters as a teaching assistant. There is no formal language requirement.

A scheduling meeting in the first quarter of enrollment is used to map out the course program in the first year. The course program is determined by a faculty advisory committee in consultation with the student and courses are drawn from Ocean Sciences and other science departments (e.g., Biology, Chemistry, Earth and Planetary Sciences, Physics). A departmental oral examination covering material from the core courses is usually taken at the beginning of a student's second year in the program and must be completed successfully within two years of entering the program. The purpose of this examination is to ensure that the doctoral student candidate has acquired sufficient fundamental knowledge of oceanography to proceed toward the doctoral degree.

A qualifying examination requiring a written research proposal to be defended orally in front of the student's qualifying examination committee is recommended to be taken during the fall quarter the year after the departmental exam of the program, normally the third year. A dissertation demonstrating original thought and research must be written, presented in an open seminar, and defended to the student's dissertation reading committee. Students are strongly encouraged to prepare their dissertation in a form suitable for publication.

Sample Pathways

The pathways within the ocean sciences Ph.D. program are differentiated from related degrees in the traditional disciplines by their focus on global-scale problems and interactions, a focus on the ocean, and their inherently interdisciplinary approach. Interdisciplinary projects across and between pathways are encouraged, as are interactions with faculty in related departments.

Biological Oceanography

This area of study involves the interactions of organisms with their chemical and physical environments. It includes research on the physiology and ecology of organisms, but differs from marine biology in its focus on the oceanographic setting of the organism in relationship to, for example, biogeochemical cycling and the effects of ocean currents on distributions of organisms. The focus is mainly on small oceanic life-forms (plankton and bacteria, molecular ecology) and their roles in the biogeochemical cycles of marine systems.

Chemical Oceanography

The measurement of chemical distributions in the sea to understand fundamental ocean processes is the focus of this area of study. Research includes development of

analytical techniques, measurement of inorganic and organic species and isotopes in marine particles and seawater, and investigation of marine biogeochemical processes using analytical and modeling approaches.

Geological Oceanography

Paleoceanography, paleoclimatology, and sediment geochemistry are the focus in this pathway. Research areas include the history of global geochemical cycles and composition of the ocean on various timescales, the fate and diagenesis of materials in sediments and their contribution to the paleoceanographic record, understanding ocean and climate history by the use of records of stable isotopes and trace elements, and paleoclimate modeling.

Physical Oceanography

The physics and dynamics of the ocean and atmosphere are the main aspects of this program. Research includes observational, computational, theoretical, and experimental physical oceanography, geophysical fluid dynamics, ocean acoustics, dynamical meteorology, climate, and global change.

Advancement to Candidacy

Course Requirements

To introduce students to the breadth and depth of the field of ocean sciences, students will be required to complete the following.

The four core ocean sciences courses are expected to be completed in the first year of the program prior to taking the departmental oral examination:

OCEA 200	Physical Oceanography	5
OCEA 220	Chemical Oceanography	5
OCEA 230	Biological Oceanography	5
OCEA 280	Marine Geology	5

Three Graduate-Level or Upper-Division Elective courses:

A minimum of three graduate-level or upper-division elective courses is required to provide depth in the chosen area of emphasis or supporting disciplines, one of which must be a 5-credit graduate-level course in statistics/data analysis, such as OCEA 260 (Introductory Data Analysis in the Ocean and Earth Sciences) or OCEA 267 (Applied Environmental Time Series Analysis). These courses are selected in consultation with the student's advisor and the department's graduate advising committee. A maximum of one course may be a graduate-level seminar (OCEA 290), and at least two courses must be graduate or upper-division undergraduate lecture courses.

Attendance in the following course is required each quarter of enrollment:

OCEA 292	Seminar
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The following course is taken prior to, or

concurrent with, being a teaching assistant:

Generally offered during the fall quarter each year.
 OCEA 296 Teaching in Ocean Sciences 2

Independent Studies or Thesis Research:

A minimum of three courses in independent studies (OCEA 297, before advancing to candidacy), or thesis research (OCEA 299, after advancing to candidacy) under the direction of an adviser. Students beyond their first year will usually take 10 or 15 credits of independent study or thesis research each quarter.

OCEA 297 Independent Study
 OCEA 299 Thesis Research

Foreign Language Requirements**Teaching Requirement**

Teaching experience is satisfied by two quarters of teaching assistant experience in ocean sciences or related departments.

Pre-Qualifying Requirements

Ph.D. students must pass a Department Examination typically taken at the beginning of their second year. The purpose of this exam is to ensure that the Ph.D. student has acquired sufficient fundamental knowledge of oceanography, and developed a suitable research plan, before developing their thesis proposal and before taking their Qualifying Examination.

Qualifying Examination

Ph.D. students must pass a departmental Qualifying examination to advance to candidacy. Students will submit a written research proposal to their qualifying examination committee, then defend this proposal orally before the committee.

Post-Qualifying Requirements**[Optional Catchall]****Dissertation****Dissertation**

The Ph.D. dissertation, demonstrating original thought and research, must be written, presented in an open seminar, and defended to the student's dissertation reading committee. It is intended to help guide and evaluate the student's program, study, and progress. The Ph.D. dissertation, satisfying all format and content requirements, must be submitted to the Graduate Division before the deadline in which all degree requirements are to be completed within the term of receiving the degree.

Dissertation Defense

The Ph.D. dissertation defense is composed of two parts: one part is the open presentation of the dissertation; the second part is a meeting, following the presentation, with the dissertation reading committee to determine completion of degree requirements. The Ph.D. dissertation defense must be presented before the deadline in which all degree requirements are to be completed within the term of receiving the degree.

Academic Progress

Ph.D. students meet with a member of the Ocean Sciences Department's advisory committee once each fall and spring. In addition, during the spring quarter each year, beginning with the second year and continuing until degree completion, students must meet with their committee members and provide an annual academic progress report to the department.

Applying for Graduation

Once requirements for degree have been met, including approval from their academic advisor and the Ocean Sciences Department, Ph.D. students may apply for the degree by the deadline for the quarter in which they would like to receive their degree. Deadlines are published in the Academic and Administrative Calendar each year.

[Optional Catchall]**Physics**

211 Interdisciplinary Sciences Building
 (831) 459-3744
<https://physics.ucsc.edu>

PROGRAMS OFFERED

Physics B.S. (p. 386)
 Physics (Astrophysics) B.S. (p. 390)
 Applied Physics B.S. (p. 394)
 Physics Minor (p. 397)
 Science Education B.S. (p. 398)
 Physics Contiguous Bachelor's/Master's Pathway (p. 402)
 Physics M.S. (p. 403)
 Physics Ph.D. (p. 404)

OTHER PROGRAMS OF INTEREST

Astrophysics Minor (p. 233)
 Astronomy and Astrophysics Ph.D. (p. 233)

Physics seeks to discover the fundamental regularities or "laws" that govern our universe and to apply these laws

to explain the behavior of fundamental and complex systems. The same underlying principles describe the behavior of atoms, lasers, living cells, and galaxies. Physics is, therefore, at the base of all modern science and technology, and this fundamental nature can be appreciated even at an elementary level.

The Physics Department offers majors in physics, physics (astrophysics), and applied physics. These programs prepare students for graduate work in physics, astrophysics, and astronomy, and for engineering and other technical positions in industry. With appropriate courses in other disciplines, these majors provide excellent preparation for advanced study in technical subjects such as biology, chemistry, engineering, geophysics, and the philosophy of science. The applied physics major is excellent preparation for positions in industry directly upon graduation.

Faculty work with students in both formal and informal settings. Students have the opportunity to do a senior thesis. If they do a senior thesis, they will work individually with a faculty member.

The main areas of physics research at UCSC are the study of fundamental particles and interactions (high-energy physics), the study of condensed matter physics, materials physics, astrophysics/cosmology, and biophysics.

Efforts in high-energy physics are aided by the presence of an organized research unit, the Santa Cruz Institute for Particle Physics (SCIPP). The SCIPP experimentalists play significant roles in experiments at some of the major accelerator laboratories in the world, including the SLAC National Accelerator Laboratory at Stanford University and the European Council for Nuclear Research (CERN) near Geneva, Switzerland. SCIPP experimentalists have also played an important role in creating the major satellite for gamma-ray astronomy (the Fermi Gamma-ray Space Telescope), are involved in the Dark Energy Survey, and conduct a thriving particle astrophysics program detecting TeV gamma rays as part of the UC VERITAS collaboration. SCIPP theorists are active in the phenomenology of high-energy particle interactions, including dark matter models, the theory of strong and electroweak interactions, electroweak symmetry breaking and Higgs bosons, theories of supersymmetry, superstrings, and gravity. SCIPP also maintains a vigorous program in particle astrophysics, including research in high-energy astrophysics, dark matter, formation of galaxies and large-scale structure in the universe, and theories of cosmology and the very early universe. SCIPP is also home to a research program in experimental biophysics, exploiting instrumentation technologies developed in other areas of physics for the study of functional organization and development of neural systems in a variety of living organisms. In addition, there is closely related research in biomedical applications such as retinal prosthesis.

The presence of the strong astrophysics group from the Astronomy and Astrophysics Department at UCSC provides a healthy symbiosis in this area. Note that the Astronomy and Astrophysics Department does not offer

an undergraduate major but does participate in teaching and mentoring Physics Department astrophysics majors. UCSC is the headquarters for the University of California Observatories, which includes the Lick Observatory near San Jose and the Keck Observatory in Hawaii. These provide additional opportunities for collaboration between researchers in physics and astronomy.

Condensed matter and materials physics research at UCSC covers a range of topics including the behavior of exotic many-electron systems (for example, superconductors) and quantum materials (such as topological insulators and Weyl semimetals); magnetic phase transitions; magnetic and magnetoelectric surfaces, interfaces, and thin films; two-dimensional materials and heterostructures; complex systems (proteins, DNA, and polymers); biophysics; and the development of new electronic devices using novel materials. The experimental program includes optical, magnetometry, magnetotransport, X-ray, and specific heat measurement techniques, as well as thin film growth and characterization facilities at UCSC. X-ray and synchrotron radiation scattering and spectroscopy measurements are available at the Lawrence Berkeley National Laboratory Advanced Light Source and at the Stanford Synchrotron Radiation Light-source, while neutron scattering measurements are performed at the NIST Center for Neutron Research and the Oak Ridge Spallation Neutron Source. Undergraduate students are actively involved in several condensed matter physics laboratories during the academic year and summer months.

UNDERGRADUATE PROGRAM

Undergraduate Majors

The physics, physics (astrophysics), and applied physics major programs provide a comprehensive coverage of the field and the background necessary for graduate school or industrial careers. Students earn a bachelor of science (B.S.) degree. The UC Santa Cruz physics, physics (astrophysics), and applied physics programs begin with a four-quarter presentation of the introductory concepts of the subject, Introduction to Physics, PHYS 5A, PHYS 5B, PHYS 5C, and PHYS 5D. Note that the applied physics program also requires completion of a general chemistry course. In order for a student to finish the UCSC physics program in four years, it is important to start the Introduction to Physics sequence as early as possible. Students who complete a major sponsored by the Physics Department cannot complete a second major sponsored by the Physics Department or a physics minor.

This introductory sequence is followed by a course that provides an introduction to quantum physics and its applications, Modern Physics, PHYS 102. The programs continue with a three-quarter sequence in mathematical methods of physics, PHYS 116A, PHYS 116B, and PHYS 116C, designed to provide the mathematics preparation necessary for most of the upper-division physics courses required for the majors. Included in the

upper-division programs are two intensive laboratory courses designed to illustrate both historical experiments that were important in the development of physics, astrophysics, and applied physics, and modern experimental methods. Advanced and especially motivated students may enroll in some graduate courses with the approval of the instructor and department chair.

The senior thesis provides the opportunity for students to apply their skills to problems of interest to them, either theoretical or experimental, usually with technical advice from a faculty member. The senior thesis may be based on the student's original research or participation in a faculty member's research project or a review of some particular area of physics, under the supervision of a faculty member. The senior thesis is a distinctive part of the UCSC physics major program and entails a substantial investment of both student and faculty time. The learning experience involved in the thesis, as well as the thesis itself, has proven extremely valuable to students in enhancing employment opportunities upon graduation or in gaining admission to graduate school.

The department is also the administrative home of the science education major, which is a collaboration between several departments in the Physical and Biological Sciences Division and the Department of Education. This major is designed for a career in teaching in California high schools by preparing students for the California Subject Examination for Teachers. (Students interested in a high school teaching career will have to fulfill additional requirements after the degree, such as earning a teaching credential.)

Courses for Non-Majors

The department offers the three-quarter sequence PHYS 6A, PHYS 6B and PHYS 6C that covers introductory physics at a level suitable for many majors. A two-quarter sequence, PHYS 7A and PHYS 7B, is tailored for students in the life sciences. A one-quarter overview of physics, PHYS 1, and a course on the physics underpinning music, PHYS 80U, are also offered by the department.

GRADUATE PROGRAM

The Physics Department offers graduate programs leading to the Master of Science (M.S.) and/or the Doctor of Philosophy (Ph.D.) degrees. Each student has a faculty advisor who helps to determine which courses are most appropriate, taking into account the student's background and interests. The student-faculty ratio is low so that M.S. and Ph.D. students can work closely with faculty and pursue programs that fit their individual needs. Research is currently conducted in theoretical and experimental particle physics, theoretical and experimental condensed matter physics (including materials physics and biophysics), and in theoretical and experimental/observational high-energy astrophysics (including cosmology).

Students may obtain a master's degree through coursework (eight physics graduate courses) and submission of an approved thesis. The thesis requirement may be waived by passing four sections of the written Ph.D. qualifying examination. Master's candidates are encouraged to write a research thesis and may do so in any of the research fields in the program, thereby developing laboratory and computational skills in areas such as electronics design, computer simulation and visualization, cryogenics, X-ray scattering, complex novel materials and devices, or materials science. Each M.S. student is assigned a faculty advisor who helps to design a coursework plan suited to the interests of the student.

Physics students and faculty use a number of UCSC research facilities described at the beginning of this section and elsewhere in this catalog, including facilities of the Santa Cruz Institute for Particle Physics (SCIPP) and the UC Observatories (headquartered at UCSC). There is strong interaction with other disciplines, especially astronomy and astrophysics, biology, chemistry, Earth sciences, electrical engineering, and mathematics. Proximity to the SLAC National Accelerator Laboratory and the Stanford Synchrotron Radiation Laboratory provides additional local research opportunities. UCSC faculty and graduate students also participate in research programs at CERN in Geneva, Los Alamos, Oak Ridge National Laboratory, NASA Ames, NREL, Lucent, Xerox, IBM, Bell Labs, and other national and international laboratories.

Application materials and brochures describing the physics M.S. and Ph.D. graduate programs in more detail may be obtained by visiting the Physics Department website or by contacting the Division of Graduate Studies.

PHYSICS B.S.

Information and Policies

Introduction

Academic Advising for the Program

The department undergraduate advisor (physicsadvising@ucsc.edu) works closely with students interested in pursuing the major to ensure that they begin the program immediately and follow the appropriate steps toward its completion.

Getting Started in the Major

Students begin the major with PHYS 5A, after having completed MATH 19A or equivalent. (Students who take PHYS 6A instead of PHYS 5A, and do very well in it, may contact the department chair for permission to enter the major.) Students are strongly encouraged to begin their major coursework in their first quarter. Those who start later should consult the department undergraduate advisor and the Alternatives webpage. Students who do not begin the lower-division requirements during their

first year will have difficulty completing the program within four years.

High school students coming directly to UC Santa Cruz should emphasize their mathematics preparation with the expectation that they will take calculus, MATH 19A, before their second quarter at UC Santa Cruz in order to take the Physics 5 series in time. Students who come to UC Santa Cruz with credit for MATH 19A will be able to start the Physics 5 series in the first quarter. The courses in the PHYS 5 and PHYS 6 series are offered multiple times per year.

Program Learning Outcomes

Learning outcomes summarize the most important knowledge, skills, abilities, and attitudes that students are expected to develop over the course of their studies. The program learning outcomes communicate the faculty's expectations to students, provide a framework for faculty evaluation of the curriculum based on empirical data, and help improve and measure the impact of implemented changes. Students graduating with a B.S. in physics will demonstrate:

PLO 1. Ability to solve problems using concepts in classical and quantum mechanics, statistical mechanics and electromagnetism.

PLO 2. Proficiency in mathematics and the mathematical concepts needed for a proper understanding of physics.

PLO 3. Ability to take measurements in a physics laboratory and analyze the measurements to draw valid conclusions.

PLO 4. Ability to communicate scientific content effectively, both orally and in writing.

Major Qualification Policy and Declaration Process

Major Qualification

To qualify to declare the physics major, students must achieve a cumulative grade point average (GPA) of 2.70 or greater in the following courses, or their equivalents:

PHYS 5A	Introduction to Physics I	5
PHYS 5B	Introduction to Physics II	5
PHYS 5C	Introduction to Physics III	5

Appeal Process

Students who are informed that they are not eligible to declare the major may appeal this decision by submitting a letter to the department chair by the later date of either 15 days from the date the notification was sent, or one week after the start of instruction during the quarter after the final relevant grade was received (generally in PHYS 5C or PHYS 5D). They also must arrange to meet with one of the faculty mentors listed for Declaring the Major. Within 15 days of receipt of the appeal, after consulting with the faculty mentor, the department chair will either finalize the denial of admission or specify further conditions for admission, and will notify the student and

their college of the decision. For more information about the appeal process, see Appeal Process.

How to Declare a Major

Students should submit a petition to declare as soon as they complete the major qualification requirements or reach their declaration deadline quarter (whichever comes first).

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed major qualification courses.

All students are required to review their academic plan with a faculty mentor prior to declaring the major. For instructions on petitioning to declare, go to Declaring Your Major.

Transfer Information and Policy

Transfer Admission Screening Policy

The following courses or their equivalents are required prior to transfer, by the end of the spring term for students planning to enter in the fall:

PHYS 5A	Introduction to Physics I	5
PHYS 5B	Introduction to Physics II	5
PHYS 5C	Introduction to Physics III	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 23A	Vector Calculus	5

A minimum GPA of 2.7 must be obtained in the following courses

PHYS 5A	Introduction to Physics I	5
PHYS 5B	Introduction to Physics II	5
PHYS 5C	Introduction to Physics III	5

In addition, the following course is recommended prior to transfer to ensure timely graduation:

PHYS 5D	Introduction to Physics IV	5
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Getting Started at UCSC as a Transfer Student

Transfer students admitted to UC Santa Cruz in the physics major who have satisfied the above screening requirements may declare the major immediately upon arrival at UC Santa Cruz. They should contact the undergraduate advisor to draw up an academic plan. Students who are proposed in a different major (other than physics (astrophysics) or applied physics) and have advanced standing when they come to UC Santa Cruz require permission from the department to change into the major.

Letter Grade Policy

All courses used to satisfy the physics major requirements must be taken for a letter grade, except the programming requirement.

[Optional Catchall]**Course Substitution Policy****Double Majors and Major/Minor Combinations Policy**

Students who complete a major sponsored by the Physics Department cannot complete a second major sponsored by the Physics Department or a physics minor.

Study Abroad**Honors**

The department awards "honors" (3.5 grade point average or better) and "highest honors" (3.8 grade point average or better) to top graduating students each year. The department also awards "honors" for outstanding work on the senior thesis, made upon the recommendation of the faculty thesis advisor.

Timely Graduation and Alternative Plans

- Students planning a senior thesis should find a faculty thesis advisor as early as possible, but no later than the beginning of the senior year for four-year students or the beginning of the second year for transfer students. For further information about the senior thesis, see Senior Thesis.
- Students who join a major program of the Physics Department with some of the required courses completed, or have room in their program for additional courses, should consult with the Physics Department undergraduate advisor.
- Students who fall behind the planners should consult the Physics Department undergraduate advisor and Alternatives.
- All the transfer major planners assume that the Intersegmental General Education Transfer Curriculum (IGETC) has been completed in community college, or has been partially completed and can be finished while at UC Santa Cruz (including summers).

[Optional Catchall]**Requirements and Planners****Course Requirements****Lower-Division Courses****Choose one of the following courses:**

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
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MATH 20A	Honors Calculus	5
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Plus one of the following courses:

MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 20B	Honors Calculus	5

Plus all of the following courses:

MATH 23A	Vector Calculus	5
MATH 23B	Vector Calculus	5
PHYS 5A	Introduction to Physics I	5
PHYS 5L	Introduction to Physics I Laboratory	1
PHYS 5B	Introduction to Physics II	5
PHYS 5M	Introduction to Physics II Laboratory	1
PHYS 5C	Introduction to Physics III	5
PHYS 5N	Introduction to Physics Laboratory III	1
PHYS 5D	Introduction to Physics IV	5

Plus one of the following courses or equivalent:

ASTR 119	Introduction to Scientific Computing	5
PHYS 115	Computational Physics	5
CSE 20	Beginning Programming in Python	5

PHYS 115 does not teach programming, but it assumes a knowledge of programming. Students should only take the course if they have learned basic programming elsewhere. Therefore, completion of PHYS 115 is sufficient to fulfill the programming requirement.

Upper-Division Courses**All of the following courses:**

PHYS 102	Modern Physics	5
PHYS 116A	Mathematical Methods in Physics	5
PHYS 116B	Mathematical Methods in Physics	5
PHYS 116C	Mathematical Methods in Physics	5
PHYS 105	Mechanics	5
PHYS 110A	Electricity, Magnetism, and Optics	5
PHYS 110B	Electricity, Magnetism, and Optics	5
PHYS 112	Thermodynamics and Statistical Mechanics	5
PHYS 133	Intermediate Laboratory	5
PHYS 134	Physics Advanced Laboratory	5
PHYS 139A	Quantum Mechanics I	5

MATH 21 and MATH 24 can substitute for PHYS 116A.

PHYS 116C is waived for students who are pursuing a dual major in physics and a mathematics B.A., and take MATH 107 in the year 2017 or later.

Programming Requirement

Students in the physics B.S. major have to satisfy a computer programming requirement by taking one of the courses listed in the major requirements given above. Of these courses, ASTR 119 teaches programming and simple applications. PHYS 115 does not teach programming; it assumes basic programming ability in Python, C++ or a similar language and discusses numerical techniques relevant to physics. The other courses listed teach programming. Students may also satisfy the computer programming requirement by demonstrating their knowledge of programming to a faculty member designated by the Physics Department. For instructions on how to demonstrate your programming skills, go to Completing the Major.

Electives

Two courses, each 5 credits or more, chosen from upper-division elective courses offered by the Physics Department or ASTR 111 - ASTR 118. In some cases, with the approval of the department, one of the elective requirements may be satisfied by an upper-division science or engineering course.

Disciplinary Communication (DC) Requirement

Students of every major must satisfy the upper-division disciplinary communication (DC) requirement. Students in the physics major satisfy the DC requirement by completing one of the following options:

Either this course			
PHYS 182	Scientific Communication for Physicists	5	
or these courses			
PHYS 195A	Senior Thesis I	5	
PHYS 195B	Senior Thesis II	5	

Comprehensive Requirement

The comprehensive requirement is satisfied by completing the following course:

PHYS 134	Physics Advanced Laboratory	5	
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Planners

Physics B.S.: Freshman Academic Plan

	Fall	Winter	Spring
1st (frosh)	MATH 19A (or MATH 20A)	MATH 19B (or MATH 20B)	MATH 23A
		PHYS 5A & PHYS 5L*	PHYS 5B & PHYS 5M

2nd (soph)	PHYS 5C & PHYS 5N	MATH 23B	PHYS 105
	PHYS 5D	CSE 20	PHYS 116C
	PHYS 116A	PHYS 116B	
3rd (junior)	PHYS 102	PHYS 112	PHYS 133
	PHYS 110A	PHYS 110B	
4th (senior)	PHYS 139A	PHYS 182**	Elective
	Elective	PHYS 134	

*Students who complete the equivalent of MATH 19A before coming to UCSC can take the PHYS 5A, PHYS 5B, PHYS 5C courses and the MATH 19B, MATH 23A, MATH 23B courses in their first year.

**Students writing a senior thesis should replace PHYS 182 with the two-quarter sequence PHYS 195A and PHYS 195B.

In addition to the specific courses shown in this planner, a student must complete courses satisfying the ER, CC, IM, TA, PR and PE general education requirements.

Students looking for an alternative pathway through the major should consult the physics advisor.

Physics B.S. Transfer Academic Plan One

	Fall	Winter	Spring
1st (junior)	MATH 23B	PHYS 116B	PHYS 116C
	PHYS 116A	PHYS 102	PHYS 105
	CSE 20	PHYS 133	PHYS 134
2nd (senior)	PHYS 110A	PHYS 110B	Elective
	PHYS 139A	PHYS 112	
	Elective	PHYS 182*	

*Students writing a senior thesis should replace PHYS 182 with the two-quarter sequence PHYS 195A and PHYS 195B.

This planner assumes that a student has completed PHYS 5D and general education requirements.

Physics B.S. Transfer Academic Plan Two

For students who have not completed the equivalent of PHYS 5D:

	Fall
1st Year	MATH 23B
	PHYS 5D
	PHYS 116A
2nd Year	PHYS 110A
	PHYS 139A
	Elective

*Students writing a senior thesis should replace PHYS 182 with the two-quarter sequence PHYS 195A and PHYS 195B.

PHYSICS (ASTROPHYSICS) B.S.**Information and Policies****Introduction****Academic Advising for the Program**

The department undergraduate advisor (physicsadvising@ucsc.edu) works closely with students interested in pursuing the major to ensure that they begin the program immediately and follow the appropriate steps toward its completion.

Getting Started in the Major

Students begin the major with PHYS 5A, after having completed MATH 19A or equivalent. (Students who take PHYS 6A instead of PHYS 5A, and do very well in it, may contact the department chair for permission to enter the major.) Students are strongly encouraged to begin their major coursework in their first quarter. Those who start later should consult the department undergraduate advisor and Alternatives. Students who do not begin the lower-division requirements during their first year will have difficulty completing the program within four years.

High school students coming directly to UC Santa Cruz should emphasize their mathematics preparation with the expectation that they will take calculus, MATH 19A, before their second quarter at UC Santa Cruz in order to take the Physics 5 series in time. Students who come to UC Santa Cruz with credit for MATH 19A will be able to start the Physics 5 series in the first quarter. The courses in the PHYS 5 and PHYS 6 series are offered multiple times per year.

Program Learning Outcomes

Program learning outcomes (PLO) summarize the most important knowledge, skills, abilities, and attitudes that students are expected to develop over the course of their studies. The program learning outcomes communicate the faculty's expectations to students, provide a framework

for faculty evaluation of the curriculum based on empirical data, and help improve and measure the impact of implemented changes. Students graduating with a B.S. in Physics (Astrophysics) will demonstrate:

Winter	Spring
PLO 1. Ability to solve problems using concepts in classical and quantum mechanics, statistical mechanics and electromagnetism.	PLO 1. Ability to solve problems using concepts in classical and quantum mechanics, statistical mechanics and electromagnetism.
PHYS 102	PHYS 133
PLO 2. Proficiency in mathematics and the mathematical concepts needed for a proper understanding of physics.	PLO 2. Proficiency in mathematics and the mathematical concepts needed for a proper understanding of physics.
PHYS 116B	PHYS 116C
PHYS 110B	PHYS 134
PLO 3. Ability to take measurements in a physics laboratory and analyze the measurements to draw valid conclusions.	PLO 3. Ability to take measurements in a physics laboratory and analyze the measurements to draw valid conclusions.
PHYS 182*	PHYS 182*
PLO 4. Ability to communicate scientific content effectively, both orally and in writing.	PLO 4. Ability to communicate scientific content effectively, both orally and in writing.

Major Qualification Policy and Declaration Process**Major Qualification**

To qualify to declare the physics (astrophysics) major, students must achieve a cumulative grade point average (GPA) of 2.70 or greater in the following courses, or their equivalents:

PHYS 5A	Introduction to Physics I	5
PHYS 5B	Introduction to Physics II	5
PHYS 5C	Introduction to Physics III	5

Appeal Process

Students who are informed that they are not eligible to declare the major may appeal this decision by submitting a letter to the department chair by the later date of either 15 days from the date the notification was sent, or one week after the start of instruction during the quarter after the final relevant grade was received (generally in PHYS 5C or PHYS 5D). They also must arrange to meet with one of the faculty mentors listed for Declaring the Major. Within 15 days of receipt of the appeal, after consulting with the faculty mentor, the department chair will either finalize the denial of admission or specify further conditions for admission, and will notify the student and their college of the decision. For more information about the appeal process, see Appeal Process.

How to Declare a Major

Students should submit a petition to declare as soon as they complete the major qualification requirements or reach their declaration deadline quarter (whichever comes first).

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed major qualification courses.

All students are required to review their academic plan with a faculty mentor prior to declaring the major. For instructions on petitioning to declare, go to Declaring Your Major.

Transfer Information and Policy

Transfer Admission Screening Policy

The following courses or their equivalents are required prior to transfer, by the end of the spring term for students planning to enter in the fall:

PHYS 5A	Introduction to Physics I	5
PHYS 5B	Introduction to Physics II	5
PHYS 5C	Introduction to Physics III	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 23A	Vector Calculus	5

A minimum GPA of 2.7 must be obtained in the following courses

PHYS 5A	Introduction to Physics I	5
PHYS 5B	Introduction to Physics II	5
PHYS 5C	Introduction to Physics III	5

In addition, the following course is recommended prior to transfer to ensure timely graduation:

PHYS 5D	Introduction to Physics IV	5
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Getting Started as a UCSC Transfer Student

Transfer students admitted to UC Santa Cruz in the physics (astrophysics) major who have satisfied the above screening requirements may declare the major immediately upon arrival at UC Santa Cruz. They should contact the undergraduate advisor to draw up an academic plan. Students who are proposed in a different major (other than physics or applied physics) and have advanced standing when they come to UC Santa Cruz require permission from the department to change into the major.

Letter Grade Policy

All courses used to satisfy the physics (astrophysics) major requirements must be taken for a letter grade, except the programming requirement.

[Optional Catchall]

[Optional Catchall]

Double Majors and Major/Minor Combinations Policy

Students who complete a major sponsored by the Physics Department cannot complete a second major sponsored by the Physics Department or a physics minor.

Study Abroad

Honors

The department awards "honors" (3.5 grade point average or better) and "highest honors" (3.8 grade point average or better) to top graduating students each year. The department also awards "honors" for outstanding work on the senior thesis, made upon the recommendation of the faculty thesis advisor.

Timely Graduation and Alternative Plans

- Students planning a senior thesis should find a faculty thesis advisor as early as possible, but no later than the beginning of the senior year for four-year students or the beginning of the second year for transfer students. For further information about the senior thesis, see Senior Thesis.
- Students who join a major program of the Physics Department with some of the required courses completed, or have room in their program for additional courses, should consult with the Physics Department undergraduate advisor.
- Students who fall behind the planners should consult the Physics Department undergraduate advisor and Alternatives.
- All the transfer major planners assume that IGETC has been completed in community college, or has been partially completed and can be finished while at UC Santa Cruz (including summers).

[Optional Catchall]

Requirements and Planners

Course Requirements

Lower-Division Courses

Choose one of the following courses:

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 20A	Honors Calculus	5

Plus one of the following courses:

MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 20B	Honors Calculus	5

Plus all of the following courses:

MATH 23A	Vector Calculus	5
MATH 23B	Vector Calculus	5
PHYS 5A	Introduction to Physics I	5
PHYS 5L	Introduction to Physics I Laboratory	1
PHYS 5B	Introduction to Physics II	5
PHYS 5M	Introduction to Physics II Laboratory	1
PHYS 5C	Introduction to Physics III	5

PHYS 5N	Introduction to Physics Laboratory III	1
PHYS 5D	Introduction to Physics IV	5

Plus one of the following courses or equivalent:

ASTR 119	Introduction to Scientific Computing	5
CSE 20	Beginning Programming in Python	5
PHYS 115	Computational Physics	5

ASTR 119 recommended. PHYS 115 does not teach programming, but it assumes a knowledge of programming. Students should only take the course if they have learned basic programming elsewhere. Therefore, completion of PHYS 115 is sufficient to fulfill the programming requirement.

Upper-Division Courses**All of the following courses:**

PHYS 102	Modern Physics	5
PHYS 116A	Mathematical Methods in Physics	5
PHYS 116B	Mathematical Methods in Physics	5
PHYS 116C	Mathematical Methods in Physics	5
PHYS 105	Mechanics	5
PHYS 110A	Electricity, Magnetism, and Optics	5
PHYS 110B	Electricity, Magnetism, and Optics	5
PHYS 112	Thermodynamics and Statistical Mechanics	5
PHYS 133	Intermediate Laboratory	5
PHYS 139A	Quantum Mechanics I	5

MATH 21 and MATH 24 can substitute for PHYS 116A.

PHYS 116C is waived for students who are pursuing a dual major in physics (astrophysics) and mathematics B.A., and take MATH 107 in the year 2017 or later.

Plus one of the following options:

Either this course		
PHYS 135	Astrophysics Advanced Laboratory	5
or these courses		
PHYS 135A	Astrophysics Advanced Laboratory	3
PHYS 135B	Astrophysics Advanced Laboratory	2
or this course		
ASTR 136	Advanced Astronomy Laboratory	5

Capacity in the lab courses is limited, and they should be taken as early as possible.

Programming Requirement

Students in the physics (astrophysics) B.S. major have to satisfy a computer programming requirement by taking one of the courses listed in the major requirements given above. Of these courses, ASTR 119 teaches programming and simple applications. PHYS 115 does not teach programming; it assumes basic programming ability in Python, C++ or a similar language and discusses numerical techniques relevant to physics. The other courses listed teach programming. Students may also satisfy the computer programming requirement by demonstrating their knowledge of programming to a faculty member designated by the Physics Department. For instructions on how to demonstrate your programming skills, go to Completing the Major.

Electives

Complete three courses, each 5 credits or more, chosen from the following:

ASTR 111	Order-of-Magnitude Astrophysics	5
ASTR 112	Physics of Stars	5
ASTR 113	Introduction to Cosmology	5
ASTR 117	High Energy Astrophysics	5
ASTR 118	Physics of Planetary Systems	5
ASTR 257	Observational Astronomy	5
PHYS 129	Nuclear and Particle Astrophysics	5
PHYS 137	Advanced Optics Laboratory	5
PHYS 171	General Relativity, Black Holes, and Cosmology	5
EART 160	Planetary Science	5
EART 162	Planetary Interiors	5
EART 163	Planetary Surfaces	5
EART 164	Planetary Atmospheres	5
AM 107	Introduction to Fluid Dynamics	5

Disciplinary Communication (DC) Requirement

Students of every major must satisfy the upper-division disciplinary communication (DC) requirement. Students in the physics (astrophysics) major satisfy the DC requirement by completing one of the following options:

Either this course		
PHYS 182	Scientific Communication for Physicists	5
or these courses		
PHYS 195A	Senior Thesis I	5
PHYS 195B	Senior Thesis II	5

Comprehensive Requirement

The comprehensive requirement is satisfied by completing one of the following options:

Either this course	
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PHYS 135	Astrophysics Advanced Laboratory	5
or these courses		
PHYS 135A	Astrophysics Advanced Laboratory	3
PHYS 135B	Astrophysics Advanced Laboratory	2
or this course		
ASTR 136	Advanced Astronomy Laboratory	5

Students looking for an alternative pathway through the major should consult the physics advisor.

Physics (Astrophysics) B.S.: Transfer Academic Plan One

	Fall	Winter	Spring
1st (junior)	MATH 23B	ASTR 119	PHYS 105
	PHYS 102	PHYS 116B	PHYS 116C
	PHYS 116A	PHYS 133	Elective
2nd (senior)	PHYS 110A	PHYS 110B	PHYS 182*
	PHYS 139A	PHYS 112	Elective
	PHYS 135A	PHYS 135B	
	Elective		

*Students writing a senior thesis should replace PHYS 182 with the two-quarter sequence PHYS 195A and PHYS 195B.

This planner assumes that a student has completed PHYS 5D and general education requirements.

Students who wish to do a more demanding senior thesis or seek greater flexibility in choosing electives may consider delaying graduation.

Physics (Astrophysics) B.S.: Transfer Academic Plan Two

For students who have not completed the equivalent of PHYS 5D.

	Fall	Winter	Spring
1st Year	MATH 23B	PHYS 102	PHYS 105
	PHYS 5D	PHYS 116B	PHYS 116C
	PHYS 116A	ASTR 119	PHYS 133
2nd Year	PHYS 110A	PHYS 110B	ASTR 136 or PHYS 135
	PHYS 139A	PHYS 112	Elective
	PHYS 182*	Elective	Elective

*Students writing a senior thesis should replace PHYS 182 with the two-quarter sequence PHYS 195A and PHYS 195B.

Planners

Physics (Astrophysics) B.S.: Freshman Academic Plan

	Fall	Winter	Spring
1st (frosh)	MATH 19A (or MATH 20A)	MATH 19B (or MATH 20B)	MATH 23A
		PHYS 5A & PHYS 5L*	PHYS 5B & PHYS 5M
2nd (soph)	PHYS 5C & PHYS 5N	MATH 23B	PHYS 105
	PHYS 5D	PHYS 116B	PHYS 116C
	PHYS 116A	ASTR 119	
3rd (junior)	PHYS 110A	PHYS 110B	PHYS 133
	PHYS 102	PHYS 112	Elective
4th (senior)	PHYS 135A	PHYS 135B	PHYS 182**
	PHYS 139A	Elective	
	Elective		

*Students who complete the equivalent of MATH 19A before coming to UCSC can take the PHYS 5A, PHYS 5B, PHYS 5C courses and the MATH 19B, MATH 23A, MATH 23B courses in their first year.

**Students writing a senior thesis should replace PHYS 182 with the two-quarter sequence PHYS 195A and PHYS 195B.

In addition to the specific courses shown in this planner, a student must complete courses satisfying the ER, CC, IM, TA, PR and PE general education requirements.

APPLIED PHYSICS B.S.

Information and Policies

Introduction

Academic Advising for the Program

The department undergraduate advisor (physicsadvising@ucsc.edu) works closely with students interested in pursuing the major to ensure that they begin the program immediately and follow the appropriate steps toward its completion.

Getting Started in the Major

Students begin the major with PHYS 5A, after having completed MATH 19A or equivalent. (Students who take PHYS 6A instead of PHYS 5A, and do very well in it, may contact the department chair for permission to enter the major.) Students are strongly encouraged to begin their major coursework in their first quarter. Those who start later should consult the department undergraduate advisor and Alternatives. Students who do not begin the lower-division requirements during their first year will have difficulty completing the program within four years.

High school students coming directly to UC Santa Cruz should emphasize their mathematics preparation with the expectation that they will take calculus, MATH 19A, before their second quarter at UC Santa Cruz in order to take the Physics 5 series in time. Students who come to UC Santa Cruz with credit for MATH 19A will be able to start the Physics 5 series in the first quarter. The courses in the PHYS 5 and PHYS 6 series are offered multiple times per year.

Program Learning Outcomes

Learning outcomes summarize the most important knowledge, skills, abilities, and attitudes that students are expected to develop over the course of their studies. The program learning outcomes communicate the faculty's expectations to students, provide a framework for faculty evaluation of the curriculum based on empirical data, and help improve and measure the impact of implemented changes. Students graduating with a B.S. in Applied Physics will demonstrate:

PLO 1. Ability to solve problems using concepts in classical and quantum mechanics, statistical mechanics and electromagnetism.

PLO 2. Proficiency in mathematics and the mathematical concepts needed for a proper understanding of physics.

PLO 3. Ability to take measurements in a physics laboratory and analyze the measurements to draw valid conclusions.

PLO 4. Ability to communicate scientific content effectively, both orally and in writing.

Major Qualification Policy and Declaration

Process

Major Qualification

To qualify to declare the Applied Physics major, students must achieve a cumulative grade point average (GPA) of 2.70 or greater in the following courses, or their equivalents:

PHYS 5A	Introduction to Physics I	5
PHYS 5B	Introduction to Physics II	5
PHYS 5C	Introduction to Physics III	5

Appeal Process

Students who are informed that they are not eligible to declare the major may appeal this decision by submitting a letter to the department chair by the later date of either 15 days from the date the notification was sent, or one week after the start of instruction during the quarter after the final relevant grade was received (generally in PHYS 5C or PHYS 5D). They also must arrange to meet with one of the faculty mentors listed for Declaring the Major. Within 15 days of receipt of the appeal, after consulting with the faculty mentor, the department chair will either finalize the denial of admission or specify further conditions for admission, and will notify the student and their college of the decision. For more information about the appeal process, see Appeal Process.

How to Declare a Major

Students should submit a petition to declare as soon as they complete the major qualification requirements or reach their declaration deadline quarter (whichever comes first).

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed major qualification courses.

All students are required to review their academic plan with a faculty mentor prior to declaring the major. For instructions on petitioning to declare, go to Declaring Your Major.

Transfer Information and Policy

Transfer Admission Screening Policy

The following courses or their equivalents are required prior to transfer, by the end of the spring term for students planning to enter in the fall:

PHYS 5A	Introduction to Physics I	5
PHYS 5B	Introduction to Physics II	5
PHYS 5C	Introduction to Physics III	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

Upper-Division Courses**All of the following courses:**

PHYS 102	Modern Physics	5
PHYS 116A	Mathematical Methods in Physics	5
PHYS 116B	Mathematical Methods in Physics	5
PHYS 116C	Mathematical Methods in Physics	5
PHYS 105	Mechanics	5
PHYS 110A	Electricity, Magnetism, and Optics	5
PHYS 110B	Electricity, Magnetism, and Optics	5
PHYS 112	Thermodynamics and Statistical Mechanics	5
PHYS 133	Intermediate Laboratory	5
PHYS 134	Physics Advanced Laboratory	5

Students may take ECE 135/ECE 135L instead of PHYS 110A and PHYS 110B. This is not recommended for students who wish to pursue graduate studies in physics.

PHYS 133 is offered all three terms. PHYS 134 (for physics B.S. and applied physics B.S. majors) is offered in the winter and spring terms. Capacity in the lab courses is limited, and they should be taken as early as possible.

MATH 21 and MATH 24 can substitute for PHYS 116A.

PHYS 116C is waived for students who are pursuing a dual major in applied physics and a mathematics B.A., and take MATH 107 in the year 2017 or later.

Programming Requirement

Students in the applied physics B.S. major have to satisfy a computer programming requirement by taking one of the courses listed in the major requirements given above. Of these courses, ASTR 119 teaches programming and simple applications. PHYS 115 does not teach programming; it assumes basic programming ability in Python, C++ or a similar language and discusses numerical techniques relevant to physics. The other courses listed teach programming. Students may also satisfy the computer programming requirement by demonstrating their knowledge of programming to a faculty member designated by the Physics Department. For instructions on how to demonstrate your programming skills, go to Completing the Major.

Electives

Complete three courses, each 5 credits or more, chosen from the following:

PHYS 115	Computational Physics	5
PHYS 120	Polymer Physics	5
PHYS 137	Advanced Optics Laboratory	5
PHYS 139A	Quantum Mechanics I	5

PHYS 139B	Quantum Mechanics II	5
PHYS 155	Solid State Physics	5
PHYS 150	Quantum Computing	5
PHYS 156	Applications of Solid State Physics	5
PHYS 160	Practical Electronics	5
PHYS 180	Biophysics	5
AM 107	Introduction to Fluid Dynamics	5
AM 114	Introduction to Dynamical Systems	5
ASTR 111	Order-of-Magnitude Astrophysics	5
CHEM 122	Principles of Instrumental Analysis	5
CHEM 146C	Advanced Laboratory in Physical Chemistry	3
CHEM 163B	Chemical Thermodynamics	5
CHEM 164	Physical Chemistry Laboratory	5
EART 121	The Atmosphere	5
EART 160	Planetary Science	5
EART 172	Geophysical Fluid Dynamics	5
ECE 101	Introduction to Electronic Circuits	5
ECE 102	Properties of Materials	5
ECE 130	Introduction to Optoelectronics and Photonics	5
ECE 136	Engineering Electromagnetics	5
ECE 115	Introduction to Solid Mechanics	5
ECE 118	Introduction to Mechatronics	10

Or other courses with approval of the undergraduate faculty advisor.

Disciplinary Communication (DC) Requirement

Students of every major must satisfy the upper-division disciplinary communication (DC) requirement. Students in the applied physics major satisfy the DC requirement by completing one of the following options:

Either this course		
PHYS 182	Scientific Communication for Physicists	5
or these courses		
PHYS 195A	Senior Thesis I	5
PHYS 195B	Senior Thesis II	5

Comprehensive Requirement

The comprehensive requirement is satisfied by completing the following course:

PHYS 134	Physics Advanced Laboratory	5
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Planners

Applied Physics B.S.: Freshman Academic Plan

Plan 1: For students who place into MATH 19A or MATH 20A.

	Fall	Winter	Spring
1st (frosh)	MATH 19A or MATH 20A	MATH 19B or MATH 20B	MATH 23A
			PHYS 5B & PHYS 5M
		PHYS 5A & PHYS 5L*	CHEM 1A or CHEM 1B
2nd (soph)	PHYS 5C & PHYS 5N	MATH 23B	PHYS 105
	PHYS 5D	CSE 20	PHYS 116C
	PHYS 116A	PHYS 116B	
3rd (junior)	PHYS 102	PHYS 110B	PHYS 134
	PHYS 110A	PHYS 112	Elective
	PHYS 133		
4th (senior)	Elective	PHYS 182**	Elective

*Students who complete the equivalent of MATH 19A before coming to UC Santa Cruz can take the PHYS 5A, PHYS 5B, PHYS 5C courses and the MATH 19B, MATH 23A, MATH 23B courses in their first year.

**Students writing a senior thesis should replace PHYS 182 with the two-quarter sequence PHYS 195A and PHYS 195B.

In addition to the specific courses shown in this planner, a student must complete courses satisfying the ER, CC, IM, TA, PR and PE general education requirements.

Students looking for an alternative pathway through the major should consult the physics advisor.

Applied Physics B.S.: Transfer Academic Plan One

	Fall	Winter	Spring
1st (junior)	MATH 23B	CSE 20	PHYS 105

PHYS 102	PHYS 116B	PHYS 116C
PHYS 116A	Elective	PHYS 133
PHYS 110A	PHYS 110B	PHYS 134
CHEM 1A or CHEM 1B	PHYS 112	Elective
Elective	PHYS 182*	

*Students writing a senior thesis should replace PHYS 182 with the two-quarter sequence PHYS 195A and PHYS 195B.

This planner assumes that a student has completed PHYS 5D and general education requirements.

Students who wish to do a more demanding senior thesis or seek greater flexibility in choosing electives may consider delaying graduation.

Applied Physics B.S.: Transfer Academic Plan Two

For students who have not completed the equivalent of PHYS 5D.

	Fall	Winter	Spring
1st Year	MATH 23B	PHYS 102	PHYS 105
	PHYS 5D	CSE 20	PHYS 133
	PHYS 116A	PHYS 116B	PHYS 116C
2nd Year	PHYS 110A	PHYS 110B	Elective
	CHEM 1A or CHEM 1B	PHYS 112	PHYS 182*
	Elective	PHYS 134	Elective

*Students writing a senior thesis should replace PHYS 182 with the two-quarter sequence PHYS 195A and PHYS 195B.

PHYSICS MINOR

Course Requirements

Lower-Division Courses

Choose one of the following options:

Either these courses		
PHYS 5A	Introduction to Physics I	5
PHYS 5L	Introduction to Physics I Laboratory	1

PHYS 5B	Introduction to Physics II	5	EART 172	Geophysical Fluid Dynamics	5
PHYS 5M	Introduction to Physics II Laboratory	1	ECE 101	Introduction to Electronic Circuits	5
PHYS 5C	Introduction to Physics III	5	ECE 102	Properties of Materials	5
PHYS 5N	Introduction to Physics III Laboratory	1	ECE 103	Signals and Systems	5
	or these courses		ECE 130	Introduction to Optoelectronics and Photonics	5
PHYS 6A	Introductory Physics I	5	ECE 136	Engineering Electromagnetics	5
PHYS 6L	Introductory Physics I Laboratory	1	ECE 141	Feedback Control Systems	5
PHYS 6B	Introductory Physics II	5	ECE 171	Analog Electronics	5
PHYS 6M	Introductory Physics II Laboratory	1	ECE 172	Advanced Analog Circuits	5
PHYS 6C	Introductory Physics III	5	ECE 178	Device Electronics	5
PHYS 6N	Introductory Physics III Laboratory	1	MATH 130	Celestial Mechanics	5

Plus the following course:

PHYS 5D	Introduction to Physics IV	5
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Plus one of the following courses:

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 20A	Honors Calculus	5

Plus one of the following courses:

MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 20B	Honors Calculus	5

MATH 20B can only be taken if a student has taken Math 20A instead of Math 19A.

Plus all of the following courses:

MATH 23A	Vector Calculus	5
MATH 23B	Vector Calculus	5

Upper-Division Courses**All of the following courses:**

PHYS 102	Modern Physics	5
PHYS 133	Intermediate Laboratory	5

Plus three elective courses

These can be any physics upper-division courses, or courses from the following list:

AM 107	Introduction to Fluid Dynamics	5
AM 114	Introduction to Dynamical Systems	5
ASTR 111	Order-of-Magnitude Astrophysics	5
ASTR 112	Physics of Stars	5
ASTR 113	Introduction to Cosmology	5
ASTR 117	High Energy Astrophysics	5
ASTR 118	Physics of Planetary Systems	5
EART 121	The Atmosphere	5
EART 160	Planetary Science	5

The elective courses cannot be offered by the department that sponsors the student's major. Other courses may be taken as electives with the approval of the Physics Department undergraduate faculty advisor.

Students who complete a major sponsored by the Physics Department cannot complete a second major sponsored by the Physics Department or the physics minor.

SCIENCE EDUCATION B.S.**Information and Policies****Introduction**

Twenty-first century science educators must be able to help their students develop and apply a scientific perspective to a wide range of information. The science education major is designed to prepare future secondary science teachers in California with a broad background across the sciences—the physical sciences, life sciences, Earth sciences, and space sciences—with advanced specialization in two fields of science (chosen from physics, chemistry, biology, and Earth sciences). The major integrates education coursework and middle and high school classroom internships designed to develop skills and knowledge relevant to teaching K-12 students in the state of California. The major is mainly intended to prepare students for teacher certification programs and the California Subject Examinations for Teachers (CSET), so that they can teach science in California high schools.

Cal Teach is one home base for all students in this major, no matter the choices for specialization. Cal Teach (CaT) provides the required sequence of middle and high school-based internships and associated courses in partnership with schools throughout Santa Cruz County. Each internship placement depends on school schedules and the intern's schedule, interests, and academic preparation. The CaT seminar courses provide the framework for science education majors to develop classroom-management strategies, practice communicating scientific concepts for non-specialists (children), and design lessons to teach the science standards currently used in K-12 education. Departmental

advising is provided by the Physics Department and the program faculty.

The program is designed to prepare outstanding candidates to enter teaching credential programs after completion. Students earn a Bachelor of Science (B.S.) degree. They do not earn a teaching credential. Most students elect to complete this after graduation. Details of how to prepare for admission to a teaching credential program are available on the Education Department's Careers in K-12 School Teaching page.

Academic Advising for the Program

Academic advising for the major is provided by the Physics Department undergraduate advisor, physicsadvising@ucsc.edu. Transfer students should also consult the Transfer Information and Policy section of this program statement. Students should contact calteach@ucsc.edu as early as possible to be set up to enroll in the Cal Teach internship courses, which are required for the major.

Getting Started in the Major

Because of the broad based nature of the major, with introductory courses in physics, chemistry and mathematics, there is considerable flexibility in what courses are taken in the first two years, as long as enough courses required for the major are completed. However, it is simplest to follow the appropriate major planner given below; students should consult with the physics undergraduate advisor if they want to do something different.

Students should complete at least two courses in the calculus sequence (MATH 11A and MATH 11B or MATH 19A and MATH 19B) in the first year; MATH 19A and MATH 19B are required for students who choose physics as one of their specializations.

Program Learning Outcomes

Learning outcomes summarize the most important knowledge, skills, abilities, and attitudes that students are expected to develop over the course of their studies. The program learning outcomes communicate the faculty's expectations to students, provide a framework for faculty evaluation of the curriculum based on empirical data, and help improve and measure the impact of implemented changes:

- Students will demonstrate knowledge and an understanding of scientific connections across the broad spectrum of the sciences.
- Students will demonstrate advanced knowledge in two areas of specialization.
- Students will show that they have learned laboratory skills in multiple scientific fields, enabling them to take measurements in a laboratory and in the field and analyze the measurements to draw valid conclusions.

- Students will communicate scientific concepts effectively and accurately, both orally and in writing, for both college-level and secondary audiences
- Students will apply strategies to address a diversity of K-12 learners' needs.

Major Qualification Policy and Declaration Process

Major Qualification

Students must complete at least six courses from the lower-division course requirements before they can declare the major. (Lecture/lab combinations count as one course.)

Appeal Process

Students who are informed that they are not eligible to declare the major may appeal this decision by submitting a letter to the program director through physicsadvising@ucsc.edu by the later date of either 15 days from the date the notification was sent, or one week after the start of instruction during the quarter after the final relevant grade was received. Within 15 days of receipt of the appeal, the program director will either finalize the denial of admission or specify further conditions for admission, and will notify the student and their college of the decision.

How to Declare a Major

Students should submit a petition to declare as soon as they complete the major qualification requirements or reach their declaration deadline quarter (whichever comes first).

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed major qualification courses.

Students should meet with the Physics Department undergraduate advisor and prepare an academic plan when they declare the major.

Transfer Information and Policy

Transfer Admission Screening Policy

Note: This major is intended for students who are interested in teaching science in high schools in the state of California. For more information, please see the program statement for this major in the UCSC General Catalog.

Six of the following courses or their equivalents are required prior to transfer, by the end of the spring term for students planning to enter in the fall.

BIOE 20B	Development and Physiology	5
BIOE 20C	Ecology and Evolution	5
BIOL 20A	Cell and Molecular Biology	5
CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1C	General Chemistry	5
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5
PHYS 6A	Introductory Physics I	5
PHYS 6B	Introductory Physics II	5
PHYS 6C	Introductory Physics III	5
STAT 5	Statistics	5

Getting Started at UCSC as a Transfer Student

Transfer students admitted to UC Santa Cruz in this major may declare the major at any time after coming to UC Santa Cruz. Contact physadvn@ucsc.edu for details. Also contact the faculty program director for the Science Education program at sci-ed@ucsc.edu immediately after coming to UC Santa Cruz, with the two fields out of physics, chemistry, biology and Earth sciences which you wish to specialize in, to prepare an academic plan. Students should also contact calteach@ucsc.edu as soon as possible after coming to UC Santa Cruz to be set up to enroll in the Cal Teach internship courses, which are required for the major.

Students who are proposed in a different major and have advanced standing when they come to UC Santa Cruz require permission from the Science Education faculty program director to change into the major.

Letter Grade Policy

All courses used to satisfy any of the major requirements must be taken for a letter grade.

[Optional Catchall]

Course Substitution Policy

Double Majors and Major/Minor Combinations Policy

Study Abroad

Honors

Honors in the major are awarded to graduating students whose academic performance demonstrates excellence at a grade point average (GPA) of 3.5 or above in the courses used to satisfy major requirements. Highest honors are awarded to those students whose performance demonstrates the highest level of excellence and results in a GPA of 3.8 or above in the courses used to satisfy major requirements. The program faculty reserve the right to withhold honors and highest honors based on other criteria such as an incident of academic dishonesty.

[Optional Catchall]

Requirements and Planners

Course Requirements

Lower-Division Courses

Choose one of the following courses:

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 11A	Calculus with Applications	5

Plus one of the following courses:

MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 11B	Calculus with Applications	5

Plus the following course:

MATH 22	Introduction to Calculus of Several Variables	5
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MATH 22 is waived for a student who chooses their electives from chemistry and biology or from Earth sciences and biology.

Plus one of the following options:

Either these courses		
PHYS 5A	Introduction to Physics I	5
PHYS 5L	Introduction to Physics I Laboratory	1
PHYS 5B	Introduction to Physics II	5
PHYS 5M	Introduction to Physics II Laboratory	1
PHYS 5C	Introduction to Physics III	5
PHYS 5N	Introduction to Physics III Laboratory III	1
or these courses		
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 6B	Introductory Physics II	5
PHYS 6M	Introductory Physics II Laboratory	1
PHYS 6C	Introductory Physics III	5
PHYS 6N	Introductory Physics III Laboratory	1

Plus all of the following courses:

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1M	General Chemistry Laboratory	2
CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2

Plus one of the following options:

Either these courses		
EART 5	California Geology	5

	CHEM 1A	CHEM 1B & CHEM 1M	CHEM 1C & CHEM 1N
2nd (soph)	PHYS 6A & PHYS 6L [#]	PHYS 6B & PHYS 6M	PHYS 6C & PHYS 6N
	BIOL 20A	BIOE 20B	BIOE 20C
	EART 5 & EART 5L	EDUC 50C**	EDUC 100C
3rd (junior)	ASTR 2	MATH 22*	EDUC 185C
	EART 110A & EART 110L	EDUC diversity course	Field A course
	Field A course	Field A course	
4th (senior)	Field B course	Field B course	Field B course
			EDUC 185L

In addition to the specific courses shown in these planners, a student must complete courses satisfying the CC, IM and TA general education requirements.

[#]Students choosing physics as one of their fields of specialization must take MATH 19A and 19B instead of MATH 11A and MATH 11B, and the PHYS 5 series of courses instead of PHYS 6.

*MATH 22 is a prerequisite for CHEM 163A (recommended for chemistry + Earth sciences) and CHEM 163B (recommended for chemistry + physics). MATH 22 is required for this major only if a student chooses physics as one of their fields or chooses the combination chemistry + Earth sciences. Consult your advisor with questions.

**See advance enrollment requirements and process in the Lower-Division Courses section above.

Field A and B refer to the two subject areas a student chooses for specialization. Courses in each field are:

1. Physics: PHYS 5D (fall), PHYS 102 (winter), PHYS 133 (spring)
2. Earth sciences: OCEA 90 (fall), EART 110B & EART 110M (winter), Earth science upper-division elective (spring).

3. Biology: BIOL 105 (fall), BIOE 107 (winter), BIOE 109 (spring)
4. Chemistry (three options):
 - a. CHEM 163A (fall), CHEM 8A & CHEM 8L (winter), CHEM 8B & CHEM 8M (spring) for chemistry with Earth sciences
 - b. CHEM 8A & CHEM 8L (fall), CHEM 163B (winter), CHEM 8B & CHEM 8M (spring) for chemistry with physics
 - c. CHEM 8A & CHEM 8L (fall), CHEM 8B & CHEM 8M (winter), CHEM 103 (spring) for chemistry with biology

Transfer Planner

	Fall	Winter	Spring
1st (junior)	EART 5 & EART 5L	EDUC 50C**	EDUC 100C
	ASTR 2	MATH 22	Field A course
	Field A course	Field A course	EDUC 185C
2nd (senior)	Breadth course 1	Breadth course 2	Breadth course 3
	EART 110A & EART 110L	EDUC diversity course	EDUC 185L
	Field B course	Field B course	Field B course

*MATH 22 is a prerequisite for CHEM 163A (recommended for chemistry + Earth sciences) and CHEM 163B (recommended for chemistry + physics). A student who has completed the equivalent at their community college will not need to complete this course at UCSC. MATH 22 is required for this major only if a student chooses physics as one of their fields or chooses the combination chemistry + Earth sciences. Consult your advisor with questions.

**See advance enrollment requirements and process in the Lower-Division Courses section above.

This planner assumes that the student has completed all general education requirements, and nine courses out of the 12 breadth requirements in physics, chemistry, biology and mathematics & statistics. The remaining three "breadth courses" can be taken in the three slots shown.

Elective courses for each field are described below the four-year planner. If courses in Field A cannot be taken in the junior year, they can be exchanged with the breadth courses shown in the senior year.

PHYSICS CONTIGUOUS

BACHELOR'S/MASTER'S PATHWAY

The five-year combined Bachelor's/Master's degree physics program provides undergraduate students the opportunity to earn a Master of Science (M.S.) degree in five years. Students are able to start their graduate coursework in their junior year and can use up to two elective requirements between degrees. This program is designed for students who intend to go into industry upon graduation and is not well-suited for those who ultimately want to obtain a Ph.D. in physics. The Combined B.S./MS. has a two-stage application, one at the departmental level (due second quarter of junior year) and then another at the graduate program level (due first quarter of senior year). Upon successful completion of their undergraduate requirements students are awarded their B.S. in Physics, and providing that they still meet the relevant criteria, may continue into the M.S. program. In order to be awarded the M.S. students finish any remaining M.S. coursework and then defend their M.S. thesis.

Requirements for taking graduate courses:

Students must perform at a B+ or better in the related undergraduate course. For example, for a student to take PHYS 210 in their senior year they must acquire a grade of B+ or better in PHYS 105.

Departmental Admission Requirements:

- 3.3 GPA overall and within physics
- Two letters of recommendation (at least one from a physics faculty member)
- Departmental Application
- Statement of Purpose. This statement should explain your interest in the BS./M.S. program and your proposed research topic.
- Due by the end of the second quarter of junior year

Graduate Program Requirements:

- 3.0 GPA overall and within physics
- Three letters of recommendation (two from physics faculty, one from research adviser)
- Unofficial transcripts
- Statement of Purpose
- Due by the end of the first quarter of their senior year.

Letters of recommendation for departmental admission requirements can overlap with letters of recommendation for graduate program requirements.

Course Requirements

All of the following

PHYS 210	Classical Mechanics	5
PHYS 212	Electromagnetism I	5
PHYS 214	Electromagnetism II	5
PHYS 215	Introduction to Non-Relativistic Quantum Mechanics	5
PHYS 216	Advanced Topics in Non-Relativistic Quantum Mechanics	5
PHYS 219	Statistical Physics	5

Plus two graduate courses from M.S. electives

PHYS 217	Quantum Field Theory I	5
PHYS 218	Quantum Field Theory II	5
PHYS 220	Theory of Many-Body Physics	5
PHYS 221A	Introduction to Particle Physics I	5
PHYS 221B	Introduction to Particle Physics II	5
PHYS 222	Quantum Field Theory III	5
PHYS 224	Particle Astrophysics and Cosmology	5
PHYS 226	General Relativity	5
PHYS 231	Introduction to Condensed Matter Physics	5
PHYS 232	Condensed Matter Physics	5
PHYS 233	Advanced Condensed Matter Physics	5
PHYS 234	Soft Condensed Matter Physics	5
PHYS 240	Polymer Physics	5
PHYS 242	Computational Physics	5
PHYS 251	Group Theory and Modern Physics	5
PHYS 290	Special Topics	5

With approval from the program director, students may take graduate courses from other departments.

PHYSICS M.S.

Introduction

The Physics Department welcomes students interested in the master's degree. Master's candidates can perform research in any of the areas covered by the department. They develop laboratory and computational skills which are of value in many fields. These include electronics design, computer simulation and visualization, cryogenics, X-ray scattering, complex novel materials and devices, materials science and biophysics. Each M.S. student is assigned a faculty adviser who helps to design a coursework plan suited to the interests of the student.

Physics students and faculty use a number of UC Santa Cruz research facilities described at the beginning of this section and elsewhere in this catalog, including facilities of the Santa Cruz Institute for Particle Physics (SCIPP) and the UC Observatories (headquartered at UC Santa Cruz). There is strong interaction with other disciplines, especially astronomy and astrophysics, biology,

chemistry, Earth sciences, electrical engineering, and mathematics. Proximity to the SLAC National Accelerator Laboratory and the Stanford Synchrotron Radiation Laboratory provides additional local research opportunities. UC Santa Cruz faculty and graduate students also participate in research programs at CERN in Geneva, Los Alamos, Oak Ridge National Laboratory, NASA Ames, NREL, Lucent, Xerox, IBM, Bell Labs, and other national and international laboratories.

The application procedure and requirements for the M.S. program is identical to those of the Ph.D. program. Application materials and brochures describing the physics M.S. and Ph.D. graduate programs in more detail may be obtained by visiting the Physics Department website or by contacting the Division of Graduate Studies.

Students pursuing the Ph.D. degree can apply for a master's degree upon successful completion of the requirements for a master's degree.

Requirements

Course Requirements

The following courses are required for M.S. students:

PHYS 202	Introduction to Teaching in Physics	1
PHYS 210	Classical Mechanics	5
PHYS 212	Electromagnetism I	5
PHYS 214	Electromagnetism II	5
PHYS 215	Introduction to Non-Relativistic Quantum Mechanics	5
PHYS 216	Advanced Topics in Non-Relativistic Quantum Mechanics	5
PHYS 219	Statistical Physics	5

Choose two of the following courses:

PHYS 217	Quantum Field Theory I	5
PHYS 218	Quantum Field Theory II	5
PHYS 220	Theory of Many-Body Physics	5
PHYS 221A	Introduction to Particle Physics I	5
PHYS 221B	Introduction to Particle Physics II	5
PHYS 222	Quantum Field Theory III	5
PHYS 224	Particle Astrophysics and Cosmology	5
PHYS 226	General Relativity	5
PHYS 231	Introduction to Condensed Matter Physics	5
PHYS 232	Condensed Matter Physics	5
PHYS 233	Advanced Condensed Matter Physics	5

PHYS 234	Soft Condensed Matter Physics	5
PHYS 240	Polymer Physics	5
PHYS 242	Computational Physics	5
PHYS 251	Group Theory and Modern Physics	5
PHYS 290	Special Topics	5

M.S. Thesis Requirement

Students may obtain a master's degree through coursework (nine physics graduate courses) and submission of an approved thesis. The thesis requirement may be waived by passing four sections of the written pre-qualifying examination. Master's candidates are encouraged to write a research thesis and may do so in any of the research fields in the program, thereby developing laboratory and computational skills in areas such as electronics design, computer simulation and visualization, cryogenics, X-ray scattering, complex novel materials and devices, or materials science. Each M.S. student is assigned a faculty adviser who helps to design a coursework plan suited to the interests of the student.

Other Requirements

[Optional Catchall]

Applying for Graduation

Students must apply for graduation in order to receive their M.S. degree. The form can be found on the physics graduate student forms page and should be submitted to the Graduate Division.

PHYSICS PH.D.

Introduction

The Physics Department welcomes students interested in the Ph.D. degree. Doctoral candidates can perform research in any of the areas covered by the department, including experimental and theoretical astrophysics, biophysics, condensed matter physics and materials science, cosmology, and particle physics theory and experiment. Each doctoral student is assigned a faculty advisor who helps to design a research project suited to the interests of the student.

The UC Santa Cruz Physics Department is committed to providing an excellent education to a diverse population of graduate students and we encourage candidates from all backgrounds to apply. We employ a holistic process to assess candidates' knowledge and passion for physics, as well as whether or not they have the perseverance and tenacity required to complete the doctoral program. Of particular importance is the alignment between the research interests of the candidate and those of the department. While taking into consideration a candidate's undergraduate grade point average (GPA), letters of recommendation, student statements, and Graduate Record Examinations (GRE) scores (if provided), we do not disqualify applicants based on any single factor. In

particular, the department recognizes the documented limitations of the GRE as an equitable predictor of success in graduate studies and research.

Admission Process

Required application materials:

- **Recommendations**
Three letters of recommendation are required. Additional letters, up to five total recommendations, will be reviewed but will not help or hurt your application.
- **Statement of Purpose**
The candidate is asked to describe plans for graduate study or research and for future occupation or profession, and to include any information that may aid the selection committee in evaluating your preparation and qualifications for graduate study at the University of California, Santa Cruz. Recommended length is a concise 1-2 pages.
- **Personal History Statement**
This statement will be used in conjunction with your application for graduate admission and financial support. Note that the Personal History Statement should not duplicate the Statement of Purpose. Recommended length is a concise 1-2 pages.
UC Santa Cruz is interested in a diverse and inclusive graduate student population. In an essay, discuss how your personal background informs your decision to pursue a graduate degree. Candidates should include any educational, familial, cultural, economic, or social experiences, challenges, or opportunities relevant to your academic journey; how you might contribute to social or cultural diversity within your chosen field; and/or how you might serve educationally underrepresented segments of society with your degree.
- **Resume**
- **Research Interests**
Candidates are asked to indicate the three research areas they are most interested in studying. This information will be used to ensure that the faculty in your areas of interest have an opportunity to review your application.
Fields of studies include:
 - Applied Physics
 - Astrophysics and cosmology experiment
 - Astrophysics and cosmology theory
 - Biophysics
 - Condensed matter experiment
 - Condensed matter theory
- Material Science
- Particle physics experiment
- Particle physics theory
- **GRE Scores** (Educational Testing Service offers a fee reduction program)
Please note that the we have recently changed our policy concerning application materials and the GRE:
 - General Exam—Optional
 - Physics Subject Exam—Recommended
- **English Language Competence**
 - Test of English as a Foreign Language (TOEFL) Exams. For those choosing to take the TOEFL, a minimum score on the paper-based TOEFL of 550, or 220 on the computer-based test, or 83 on the Internet-based test is required for admission. **Any international students who wish to be considered for teaching assistant opportunities must score a 26 or higher on the spoken word portion of the Internet-based test.**
 - International English Language Testing System (IELTS) Exams. For those choosing to take the IELTS, a minimum overall score of 7 from the IELTS test is required for admission. **A speaking portion score of 8 from the IELTS test is required for all new international students who may serve as a teaching Assistant at any time during their graduate career.**
- **Grade Point Average**
 - Undergraduate GPA and Scale
 - Upper-division GPA. Calculate your GPA in your junior and senior level physics and mathematics courses.
 - Graduate GPA and Scale (if applicable)
- **Transcripts**
Unofficial transcripts must be uploaded to the application before you can submit this application. You must upload at least one transcript to your application. For review and decision purposes we accept electronic versions (PDF) of your academic records, which we consider to be "unofficial." If an offer of admission is made, you will be required to send us official paper documents for verification. Admission offers will not be considered final until we have received the official documents that match the uploaded record.
- **Academic Information (publications, teaching experience, etc.)**

List articles, books, or any other materials published, with dates of publication. Provide URLs to publications where possible. List name, approximate dates, and location of any institution at which you have taught.

- **Present Occupation or Position**
- **Language Proficiency**
Describe degree of proficiency (reading and speaking) in languages other than your first language.
- **Foreign Language Proficiency**
- **Research Work**
List relevant advanced or research work that you have completed in your chosen field of study.
- **Research Experience**
- **Diversity Fellowships**
This page is optional. The Santa Cruz campus of the University of California has a longstanding goal of achieving a graduate student population that reflects the diversity of the state. Applicants who have excellent potential as future faculty and researchers, and whose enrollment would contribute to the diversity of our graduate student population, are invited to apply for these fellowships. You should complete this form if you believe that you meet both criteria and wish to be considered for one of these awards.

Advancement to Candidacy

The following sections are meant to define all that is necessary to advance to candidacy for the Ph.D. degree.

Course Requirements

Core courses

In the first year of study, Ph.D. students are expected to take two core graduate-level courses per quarter from the following list of courses required for the Ph.D. degree:

PHYS 210	Classical Mechanics	5
PHYS 212	Electromagnetism I	5
PHYS 214	Electromagnetism II	5
PHYS 215	Introduction to Non-Relativistic Quantum Mechanics	5
PHYS 216	Advanced Topics in Non-Relativistic Quantum Mechanics	5
PHYS 219	Statistical Physics	5

One or more of these first-year courses can be waived if students have taken equivalent graduate-level courses at their undergraduate institution. However, this requires that the course covers the material in the first-year courses syllabi, that the students obtained a satisfactory grade, and that the student passes the associated written qualifying examination.

First-year students are also required to take the following two courses:

PHYS 205	Introduction to Research in Physics	2
PHYS 202	Introduction to Teaching in Physics	1

First- and second-year students are required to take the following course every quarter:

PHYS 292	Seminar
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Pre-Qualifying Requirements

All students in the Ph.D. program must pass a qualifying examination consisting of five written tests in the areas of mathematical methods for physics, classical mechanics, quantum mechanics, statistical mechanics, and electricity and magnetism. Students have a first opportunity to take these five tests at the beginning of their first year. Once a student passes an examination in any one of the five areas they do not need to take an exam in that area again. If necessary, each student has a second opportunity to pass the written tests at the beginning of the second year. Students with at most one or two failed tests have a third opportunity to pass their remaining tests at the beginning of the winter quarter of their second year. Students who fail any of the remaining tests at this third and last attempt, and students who have not passed three or more of the five written tests after two attempts can either transfer to the terminal M.S. program (the M.S. degree is automatically awarded to students who passed at least four of the five sections, and it requires an additional written research thesis for those who only passed three of the five sections), or appeal to the Graduate Committee to continue on the Ph.D. route. In this latter case, the Graduate Committee considers whether there is evidence of likely success in the Ph.D. program. The committee evaluates and reviews the student's progress toward candidacy, including performance in courses and progress in research, and recommends possible remedial coursework or an oral examination, or recommends that the student transfer to the terminal M.S. route.

Qualifying Examination

After identifying an appropriate research project with their faculty advisor, students form an Oral Qualifying Examination Committee.

At a time determined in consultation with their advisor, the student takes the Oral Qualifying Examination. The student presents their research progress, outlines a path to successful completion of their dissertation work, and answers questions both about their research program and about the research area generally. The graduate advisor and/or the Graduate Committee can provide guidance as to the procedures for selection of committee membership, the format of the examination, and required reporting.

Post-Qualifying Requirements

[Optional Catchall]

Dissertation

Dissertation

Students complete a dissertation under the supervision of their research advisor. When the student and advisor agree that the thesis is nearing completion or is complete, the thesis is examined by the student's dissertation reading committee (typically composed of the same members as the Oral Qualifying Examination Committee).

Dissertation Defense

A public dissertation defense is required. Students should work with their committee to confirm a defense date and time. The Physics Department can assist with providing a room for the defense and with publicizing the event. Students should have a final or nearly final draft of their dissertation and provide it to their committee prior to the defense. We suggest at least one month prior, but this is at the committee's discretion. The graduate advisor and/or the Graduate Committee can provide guidance as to the procedures for selection of committee membership, the format of the examination, and required reporting.

Academic Progress

Annual evaluation ordinarily is the joint responsibility of the graduate coordinator and the assigned faculty advisor or the chair of the student's doctoral committee. An evaluation should include a brief review of the student's work to date, with particular attention to the period since the last report, describing the student's progress toward the degree, pointing out any areas in which improvement is recommended or required, and establishing academic objectives for the following period.

The results of annual reviews are committed to writing and signed by the supervisor and another faculty member. This is to ensure evaluation and consent by more than one individual faculty member, who may also be a principal source of financial and other support. Before a doctoral student has advanced to candidacy, the second signer may be the graduate coordinator; after advancement, a second thesis committee member must also sign. The annual evaluations are distributed to the student and kept in the student's file in the department office. They form the basis for decisions about continued financial support, academic probation and/or dismissal, extensions of financial aid beyond normative time, and other matters.

Normative time to degree for the program is five years.

Applying for Graduation

Students should apply for the Ph.D. at the beginning of the term in which they will complete all degree requirements. The necessary form is called Application for the Ph.D Degree and can be found on the Division of Graduate Studies forms page.

[Optional Catchall]

Science Communication

Kresge Annex A
(831) 459-4475
<https://scicom.ucsc.edu>

PROGRAMS OFFERED

Science Communication M.S. (p. 407)

SCIENCE COMMUNICATION M.S.

Introduction

The Science Communication (SCIC) Master's program is a graduate program comprised of one track: science writing. Students combine a background in scientific research with a desire to communicate science to the general public. The program focuses on the practice of conceiving, reporting, writing, and editing articles on scientific, medical, environmental, and technological subjects for newspapers and magazines, online news outlets, universities and federal agencies, and special publications directed at general readers. The program in science writing offers intensive training in news, features, multimedia storytelling, profiles and essays, and investigative reporting. Graduates receive a Master of Science (M.S.) in science writing. For more information about our graduation rates and other information, please visit our website.

Requirements

Course Requirements

The program accepts 10 students per year. Enrollment in science writing classes is strictly limited to students enrolled in the program. The program consists of one academic year of full-time study, beginning in fall quarter, followed by a full-time summer internship lasting a minimum of 10 weeks. Science Notes, the UCSC online science magazine, is produced annually by the graduate students. Please see the current issue and an archive of past issues on our website.

The program consists of a required sequence of six courses covering the main skills of professional journalism:

SCIC 201A	Reporting and Writing Science News	5
SCIC 201B	The Science Feature	5
SCIC 201C	Profile and Essay Writing	5
SCIC 201D	Policy and Investigative Reporting	5
SCIC 201E	Multimedia Science News	5
SCIC 202	Writing and Editing Workshop	5

Other Requirements

Admission to the Science Communication

Graduate Program

Students who have an intimate acquaintance with the theory and practice of science, an aptitude for writing, and a strong desire to communicate science to the general public are ideal candidates for the program. All applicants must have a prior degree in science or engineering (B.S./B.A., M.S., or Ph.D.) to be eligible. Other admission requirements are: full-time research experience of at least six months duration; official Graduate Record Exam (GRE) General Test scores; and at least three references from faculty or supervisors familiar with the applicant's research and communications skills. Applications and instructions can be found online through the UCSC Graduate Division website.

Further Information

Details about the Science Communication M.S. program may be obtained from the Science Communication Program office, our website, or by sending e-mail to scicom@ucsc.edu.

[Optional Catchall]

Applying for Graduation

BASKIN SCHOOL OF ENGINEERING

Baskin School of Engineering
335 Baskin Engineering Building
(831) 459-2158
<https://www.soe.ucsc.edu/>

Dean's Office
335 Baskin Engineering
(831) 459-2158

Undergraduate Office
227 Baskin Engineering
(831) 459-5840

Graduate Office
595 Engineering 2
(831) 459-3531

Professor Alexander Wolf, Dean

The Baskin School of Engineering (BSOE) has a high-technology focus incorporating programs and curricula that educate students to meet the changing demands of society and a high-technology global marketplace. The school offers a stimulating academic environment that provides a foundation for professional growth as well as a lifetime of learning. The Baskin School's programs and courses prepare students for the human aspects, as well as the technical challenges, of careers in engineering, computer science, and bioinformatics. The Baskin School of Engineering includes the Department of Applied Mathematics, the Department of Biomolecular Engineering, the Department of Computational Media, the Department of Computer Science and Engineering,

the Department of Electrical and Computer Engineering, and the Department of Statistics.

GRADUATE STUDY

The Baskin School of Engineering offers 17 graduate programs designed to prepare students for advanced study and research in major areas of biomolecular, computer, and electrical engineering, as well as statistics and applied mathematics:

- Applied Mathematics M.S. and Ph.D.
- Biomolecular Engineering and Bioinformatics M.S. and Ph.D.
- Computational Media M.S. and Ph.D.
- Computer Engineering M.S. and Ph.D.
- Computer Science and Engineering M.S. and Ph.D.
- Electrical and Computer Engineering M.S. and Ph.D.
- Games and Playable Media M.S.
- Human Computer Interaction M.S.
- Natural Language Processing M.S.
- Scientific Computing and Applied Mathematics M.S.
- Serious Games M.S.
- Statistical Science M.S. and Ph.D.

These programs are described in subsequent sections. The aim of these programs is to develop professionals who can address the complex scientific and technological problems of today and tomorrow.

Graduate Student Affairs Office

The Baskin School of Engineering Graduate Student Affairs/Advising Office offers general advising for prospective and current students in the School of Engineering graduate programs. The office handles general advising, financial support processing, and degree certifications. Graduate students obtain and submit all paperwork requiring departmental approval to the Graduate Student Affairs office. Students may obtain additional information and assistance on the School of Engineering Graduate Student Affairs website.

UNDERGRADUATE STUDY

Undergraduate Majors

The School of Engineering offers eight undergraduate Bachelor of Science (B.S.), three Bachelor of Arts (B.A.) and three contiguous B.S./M.S. degree programs in the following majors:

- Applied Mathematics B.S.

- Biomolecular Engineering and Bioinformatics B.S. or contiguous B.S./M.S.*
- Biotechnology B.A.
- Computer Engineering B.S. or combined B.S./M.S.
- Computer Science B.A. and B.S. or combined B.S./M.S.
- Computer Science: Computer Game Design B.S.
- Electrical Engineering B.S.
- Network and Digital Technology B.A.
- Robotics Engineering B.S.
- Technology and Information Management B.S.

*The contiguous B.S./M.S. is only available from the bioinformatics concentration in the B.S.

Applied Mathematics. Applied mathematics is a field of research specializing in the development and application of analytical and numerical tools and techniques toward the solution of complex quantitative problems in science and engineering. A Bachelor of Science (B.S.) in Applied Mathematics prepares graduates for careers in the industry (usually in research and development) or academia (either in teaching and/or in research at university or governmental laboratories or agencies). It can be a terminal degree, or prepare students for graduate school in applied mathematics or related fields.

Biomolecular Engineering and Bioinformatics. The biomolecular engineering and bioinformatics major includes the biomolecular engineering (BME) and bioinformatics (BINF) concentrations. The BME concentration is designed for students interested in protein engineering, stem cell engineering, and synthetic biology. The emphasis is on designing biomolecules (DNA, RNA, proteins) and cells for particular functions, and the underlying sciences are biochemistry and cell biology. The BINF concentration combines mathematics, science, and engineering to explore and understand biological data from high-throughput experiments, such as genome sequencing, gene-expression chips, and proteomics experiments. The program builds upon the research and academic strengths of the faculty in the Biomolecular Engineering Department.

Biotechnology. The Bachelor of Arts in Biotechnology is intended for students who plan to be involved in the biotechnology industry as writers, artists, ethicists, executives, sales force, regulators, lawyers, politicians, and other roles that require an understanding of the technology, but not the intensive training needed for technicians, research scientists, engineers, and bioinformaticians. (For those more technical roles, the biomolecular engineering and bioinformatics major or the molecular, cell, and developmental biology major is recommended.) A biotechnology student completing the program will have familiarity with several different biotechnologies and be able to apply ethical reasoning to

make decisions about biotechnology in a global, economic, environmental, and societal context.

Computer Engineering. The computer engineering curriculum focuses on making digital systems that work. It overlaps with computer science on one end (software systems) and with electrical engineering on the other (digital hardware). The emphasis of our program is on design rather than analysis—on making things work, rather than on explaining the abstract theory of computation or electronics. The program's emphasis on problem solving provides both excellent training for future engineers and a strong foundation for graduate study. The combined B.S./M.S. program provides an opportunity for outstanding undergraduates to begin advanced study and earn both degrees in five years.

Computer Science. The computer science curriculum has options that include topics in hardware and software, giving students a solid grounding in both theoretical and practical aspects of computer technology and computer usage. The bachelor of arts focus is designed to give students a solid grounding in both theoretical and practical topics in computer science, computer engineering, and mathematics while leaving flexibility for a broad program of study, including many courses outside of science and engineering. The bachelor of science curriculum has a stronger concentration in the sciences, with more courses in computer science and computer engineering. Students become proficient in many areas, with a good academic foundation for various careers in the software industry, as well as preparation for graduate school.

Computer Science: Computer Game Design. The computer game design curriculum is a four-year interdisciplinary program that focuses on the technical, dramatic, and artistic elements of computer games. The program provides a rigorous education in computer science, in concert with a broad introduction to those aspects of art, music, narrative, digital media, and computer engineering most relevant to games. An intensive year-long game design studio sequence permits students to create substantial video games as part of a multi-student team. Students receive proficiency in many aspects of computer science, a good academic foundation for careers in the computer game industry or information technology industry, or for the pursuit of graduate studies in computer science, or computer game design.

Electrical Engineering. The electrical engineering curriculum provides a balance of engineering science and design and allows students to specialize in both the traditional topics and the latest subjects in electrical engineering. Students may concentrate their electives in the areas of electronics and optics, or communications, signals and systems. The major is designed to attract motivated students who, upon graduation, will be sought by employers in the high-tech industry. The electrical engineering program is accredited by The Engineering Accreditation Commission of ABET, <https://www.abet.org>.

Network and Digital Technology. The network and digital technology B.A. program provides students with in-depth knowledge of the underlying structure and function of network and computer technology and the design processes which make these technologies function. The program, through its flexible requirements, is especially tailored to students who wish to combine technology with other fields, such as through a double major or a minor, or who, through the choice of electives, wish to concentrate on the digital design or computer networks aspects of computer engineering in preparation for future employment. The network and digital technology B.A. program is offered by the Computer Science and Engineering Department.

Robotics Engineering. The robotics engineering program prepares graduates for rewarding careers at the interfaces between electrical, computer, and mechanical engineering. UCSC robotics engineering graduates will have a thorough grounding in the principles and practices of robotics and control, and the scientific and mathematical principles upon which they are built; graduates will be prepared for further education (both formal and informal) and for productive employment in industry.

Technology and Information Management. The technology and information management (TIM) curriculum is multidisciplinary and focuses on the fusion of information systems, technology, and business management for two purposes: the use of information systems to solve business problems and the management of technology, which includes new product development and enterprise management. Students must learn the mathematics, science, and technical fundamentals of computer science and engineering as well as understand the environment in which information technology (IT) solutions will be applied—through economics, business, and management of technology courses. It is a rigorous, challenging major for those students wanting to pursue careers in information systems management and the management of technology.

Undergraduate Minors

Undergraduate students may choose from the following nine minor options:

Applied Mathematics. The applied mathematics minor is available to students who wish to develop 1) proficiency in modeling real-life problems using mathematics and 2) knowledge of standard, practical analytical and numerical methods for the solution of these models. This minor could be combined with a major in any of the physical, biological, mathematical, or engineering sciences as preparation for a graduate degree in that field or in applied mathematics.

Assistive Technology. The guiding principle of the assistive technology minor is robotic assistance for people with movement disabilities, which can include such concepts as motorized prostheses, exosuits, motorized wheelchairs, or follow-me luggage.

Bioelectronics and Biophotonics. The bioelectronics and biophotonics minor is primarily focused on electronics and photonics from devices to systems required for interfacing biology with electronics from sensors to actuators and diagnostics.

Bioinformatics. The bioinformatics minor is intended primarily for bioinformatics tool users who are majoring in a biological or chemical specialty. The bioinformatics minor is also appropriate for computer science or computer engineering majors who are considering graduate work in bioinformatics.

Computer Engineering. The computer engineering minor provides a solid foundation in digital hardware, electronics, and computer software, as well as the prerequisite material in mathematics and physics. The minor is well-suited to students who wish to take part in the design of computer and embedded systems in any discipline.

Computer Science. The computer science minor is available for students whose primary interest is in another area, and are interested in the applications of computer science in other areas of study, from art and music to business and science.

Electrical Engineering. The electrical engineering minor provides a solid foundation in the core areas of electronic circuits and signals and systems, as well as the prerequisite material in mathematics and physics. Concentration of upper-division electives in either of the major tracks constitutes substantial and focused work in the discipline of electrical engineering. This minor is particularly suitable for students with majors in applied physics or any School of Engineering major.

Statistics. The statistics minor is available for students who wish to gain a quantitative understanding of how to a) measure uncertainty, and b) make good decisions on the basis of incomplete or imperfect information and apply these skills to their interests in another field. This minor could also be combined with a major in mathematics as preparation for a graduate degree in statistics or biostatistics.

Technology and Information Management. The technology and information management minor provides undergraduates in the School of Engineering as well in other programs and divisions in the university, such as economics and business management economics, the physical and biological sciences, and arts, the opportunity to expand the breadth of their knowledge and training to include the management of information systems and the management of technology.

UNDERGRADUATE ADVISING OFFICE

The Baskin School of Engineering undergraduate advising office offers general advising for prospective and declared undergraduates majoring in School of Engineering programs. The office handles major

declarations, transfer credits, course substitutions, articulations, and degree certifications. Undergraduate students obtain and submit all paperwork requiring departmental approval to the undergraduate advising office. Students may obtain additional information and assistance on the School of Engineering undergraduate advising website.

ADMISSION TO SCHOOL OF ENGINEERING MAJORS

High School Preparation for Engineering Students

It is recommended that high school students intending to apply to a School of Engineering major have completed four years of mathematics (through advanced algebra and trigonometry) and three years of science in high school. Comparable college mathematics and science courses completed at other institutions also serve to properly prepare students for these majors.

College Board Advanced Placement Credit

Prospective students are encouraged to take the College Board Advanced Placement (AP) and International Baccalaureate (IBH) Examinations as acceptable scores on these examinations may satisfy both university or major degree requirements. Prospective engineering students should consider taking examinations in computer science, mathematics, economics, chemistry, physics, or biology. Students must provide official examination scores to the UCSC Office of Admissions to be granted credit toward course prerequisites or degree requirements. The following AP and IBH scores are accepted for course credit requirements as follows:

CEEB AP Exam	Score	UCSC Course Credit
Biology	5	Biology 20A, Cell and Molecular Biology; and Biology 20B, Development and Physiology
Chemistry	5	Chemistry 1A, General Chemistry
Computer Science: Exam A	3	Computer Science and Engineering 10, Introduction to Computer Science
	4 or 5	Computer Science and Engineering 20, Beginning Programming in Python
Economics: Microeconomics	4 or 5	Economics 1, Introductory Microeconomics
Economics: Macroeconomics	4 or 5	Economics 2, Introductory Macroeconomics
Mathematics: Calculus AB	3	Mathematics 3 or Applied Mathematics 3, Precalculus
Mathematics: Calculus AB	4 or 5	Mathematics 3 or Applied Mathematics 3, Precalculus Mathematics 11A, Calculus with Applications Mathematics 19A, Calculus for Science, Engineering and Math
Mathematics: Calculus BC	3	Mathematics 3 or Applied Mathematics 3, Precalculus Mathematics 11A, Calculus with Applications Mathematics 19A, Calculus for Science, Engineering and Math

Mathematics: Calculus BC	4 or 5	Mathematics 3 or Applied Mathematics 3, Precalculus Mathematics 11A, Calculus with Applications; and Mathematics 11B, Calculus with Applications Mathematics 19A, Calculus for Science, Engineering and Math; and Mathematics 19B Calculus for Science, Engineering and Math
Physics: C Mechanics*	4 or 5	Physics 6A
	5	Physics 5A
Physics: C Electricity and Magnetism*	4,5	Physics 6C
	5	Physics 5C

International Baccalaureate Credit

IBH Exam	Score	UCSC Course Credit
Computer Science	5, 6, 7	Computer Science and Engineering 20, Beginning Programming in Python

*Students who earn AP course credit for Physics 5A or 6A and Physics 5C or 6C who are pursuing School of Engineering majors that require physics, will need to take the associated laboratories once at UC Santa Cruz to satisfy major requirements. For specific lab course to take, students should refer to the specific major's list of requirements which can be found on the curriculum chart for their major.

Students may check with the Office of Admissions for details about other AP and IBH examinations that also satisfy university requirements.

Admission as First-Year Students

Students interested in pursuing a School of Engineering major should indicate the major as their first or second choice on the UC application for admissions. Most School of Engineering programs require that students be listed as a proposed major in order to be admitted. The proposed major status is also required to enroll in many BSOE major courses.

Computer Science

Students interested in pursuing a computer science B.S. or B.A. **must** indicate the major on their University of

California application for admission. Students who do not indicate this on their application will **NOT** be allowed to declare the computer science major. Students must be admitted as proposed computer science majors in order to declare the major.

PROPOSED MAJOR RETENTION

A proposed engineering major status carries several benefits including being connected to advising, receiving pertinent communication, and priority access to enrolling in some required major courses. The School of Engineering majors require students to be listed as a proposed major in one of the following majors in order to declare: biomolecular engineering and bioinformatics, computer engineering, computer science: computer game design, computer science (B.A. and B.S.), electrical engineering, robotics or technology and information management.

Students who are interested in computer science who are **NOT** listed as proposed computer science majors will not be allowed to migrate into the major. Students must properly list computer science as their proposed major.

Students pursuing network and digital technology and biotechnology are not required to be proposed in any BSOE majors in order to declare network and digital technology and biotechnology.

Students in their fourth quarter or beyond who would like to become a proposed major, or students who are proposed and would like to retain their proposed status, must have passed MATH 19A or MATH 20A, and two additional BSOE classes from the following list within their first three quarters: CHEM 1A, CHEM 1B, CSE 12, ECE 13 or CSE 13S, CSE 16, CSE 30, MATH 19B, MATH 20B, PHYS 5A, PHYS 5C, TIM 50, or TIM 58.

Students who are in an engineering proposed major and who do not meet these criteria will be removed from their proposed major. Students who want to change to an engineering proposed major must also meet these criteria. Students that do not meet these criteria can appeal this decision within 15 days of notification. Within 15 days of receipt of the appeal, the student will receive the appeal decision. More information about the appeals process can be found on the Undergraduate Advising website.

DECLARING A SCHOOL OF ENGINEERING MAJOR

The School of Engineering major declaration process can be found on the BSOE Undergraduate Advising Declare Your Major page. Students should start the declaration of the major process as soon as they complete the major qualification requirements or reach their declaration deadline quarter (whichever comes first). Major qualification criteria for BSOE majors are specified on the BSOE Undergraduate Advising Major Qualification Requirements page.

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed major qualification courses. Major declaration petitions must be submitted by the sixth quarter of study at UC Santa Cruz (second regular quarter for students admitted with upper-division standing), including students petitioning to declare a BSOE major as their second major.

Appeal Process

Students who are informed that they are not eligible to declare the major may appeal this decision within 15 days of notification by following the steps on the BSOE Undergraduate Advising Major Declaration Appeal site. In most cases, within 15 days of receipt of the appeal, the student will receive the appeal decision.

If you have further questions concerning the appeal process, please contact the Undergraduate Advising Office at (831) 459-5840 or email bsoeadvising@ucsc.edu.

JUNIOR TRANSFER ACCEPTANCE TO MAJORS

The School of Engineering strongly encourages applications from transfer students. Due to the prerequisite structure for upper-division courses, prospective transfer students should have completed as many of the lower-division major requirements as possible to complete the degree within a reasonable time. Students must plan carefully because many courses must be taken sequentially.

Students are encouraged to follow the new UC Transfer Pathways. Any student who finishes the UC Transfer Pathways courses for computer science will more than satisfy the admission requirements for transfer to computer science, computer engineering, robotics, and network and digital technology. Any student who finishes the UC Transfer Pathways courses for electrical engineering will more than satisfy the admission requirements for electrical engineering, computer engineering, and robotics. Note that each department will have different GPA requirements for these courses.

Completion of mathematics and engineering courses is essential for transfer students; those applying to selective majors should carefully verify the admission requirements for their major.

Students who apply as transfer students with junior status (90 quarter credits or more of transfer credit) who wish to earn a degree from the School of Engineering must indicate a School of Engineering major as their first choice on their UC application.

Acceptance into the major is based on the student's academic college record and preparation for the major. Applicants are encouraged to take and excel in as many courses that are equivalent to the department's lower-division major requirements as possible. For many School of Engineering majors, this includes completion of a year of calculus (accepted as equivalent to Mathematics 19A-B), linear algebra, differential equations, a year of calculus-based physics courses (accepted as equivalent to Physics 5A, 5B, 5C), and two programming courses are strongly recommended.

LETTER GRADE POLICY

Starting fall 2014, all students admitted to a School of Engineering major, or seeking admission to a major, must take all courses required for that major for a letter grade.

ETHICS REQUIREMENT

Graduates of the Baskin School of Engineering are expected to become professionals with the highest ethical standards. Knowledge and practice of professional ethics is a requirement for the degree. Examples of professional society codes of ethics are available on the IEEE and ACM websites. Students of the Baskin School of Engineering are also expected to adhere to high ethical standards while pursuing their undergraduate studies.

SUBSTITUTIONS FOR COURSES TAKEN AT UCSC

Undergraduate engineering students who wish to substitute a major course with a course from UC Santa Cruz must first consult the School of Engineering Undergraduate Advising Office. The advising office requires a Petition for Course Substitution be approved before credit for an alternate course can be applied to any School of Engineering major requirement.

Petition forms are available at the undergraduate advising office and on the Undergraduate Affairs Forms, Petitions, and Policies page.

Petitions and procedures for approval must be obtained from and submitted to the Undergraduate Advising Office.

COURSE EQUIVALENCIES AND SUBSTITUTIONS TAKEN AT AN OUTSIDE INSTITUTION

Once enrolled in the School of Engineering continuing students must have permission to take courses at another institution to apply toward their School of Engineering major or minor requirements.

Community Colleges

Once enrolled in the School of Engineering students who wish to take a course at a California community college must first check Assist.org to see if the course is equivalent at UC Santa Cruz. If the course is not listed on Assist.org, students must submit a course substitution petition to the BSOE Undergraduate Advising Office to have it reviewed for equivalency. Courses that need to be reviewed must be accompanied by a course description and syllabus. It is very helpful if students can provide further evidence of course content, such as examples of programming assignments, homework, or examinations. To guarantee equivalency, departments may sometimes require a grade of B or better.

If the course is approved for equivalency or was on Assist.org, then the student must also receive approval by their major department to take the class at the community college **PRIOR** to taking it. Forms and procedures for approval can be obtained from and submitted to the BSOE Undergraduate Advising Office.

Four-Year Institutions and the UC Education Abroad Program (UCEAP)

Students who intend to take a course at a four-year institution or UC Education Abroad, must submit a Course Substitution Petition to the BSOE Undergraduate Advising Office to have the course reviewed for equivalency. Courses that need to be reviewed must be accompanied by a course description and syllabus. It is very helpful if students can provide further evidence of course content, such as examples of programming assignments, homework, or examinations. To guarantee equivalency, departments may sometimes require a grade of B or better.

If the course is approved for equivalency, then the student must also receive approval by their major department **PRIOR** to taking the class. Forms and procedures for approval can be obtained from and submitted to the BSOE Undergraduate Advising Office.

COMPUTING

Personal Computer Requirement

The Baskin School of Engineering (BSOE) requires that all BSOE students own a laptop. A MAC or PC from the last several years is generally acceptable. The exact minimum specifications appear on the Undergraduate Advising website.

Computing Facilities

The Baskin School of Engineering houses research facilities and teaching laboratories in the Baskin Engineering Building for courses in programming, software design, circuits, electronics, graphics, digital design, and computer and system architecture. Emphasis in these laboratories is on state-of-the-art equipment, including personal computers, engineering workstations,

a 1000-processor Linux cluster, logic analyzers, microprocessor development systems, a wireless network for mobile computers, and network support at 100MB/sec. All Unix computers and workstations and most personal computers on campus are networked together, allowing students to access the School of Engineering and the Information Technology Services (ITS) facilities from any computer account on campus. For a more complete description of the computing facilities on campus, see the ITS website.

PREREQUISITES

Because of the sequential nature of the School of Engineering curricula, most courses have prerequisites, which are listed in the course descriptions. Students should carefully review these descriptions in the catalog and the quarterly Schedule of Classes. Students must have passed all prerequisites of a course for which they are enrolling. Pre-enrolled students who then fail a prerequisite are no longer eligible to be enrolled in the course and will be dropped.

Students who have transferable course work from another institution that appears to satisfy a UCSC course prerequisite, but is not listed in current articulation agreements, should promptly consult with the School of Engineering's staff advisers for guidance. Students will be asked to present records from the other institution to document the course equivalency. Until such evidence has been verified by the department, students attempting to enroll in a course using a prerequisite course that was not completed at UCSC will be informed that they have not satisfied the course prerequisite. (See Course Equivalencies and Substitutions Taken at an Outside Institution above.)

PERMISSION NUMBERS

Students not meeting the regular prerequisite requirements for courses sponsored by the Baskin School of Engineering may petition the course instructor to receive a permission number to enroll. The instructor may ask a student to demonstrate the ability and/or potential to succeed in the course or may request additional information to formulate a decision. If no instructor has been assigned to the course, please contact the Undergraduate Advising Office for direction. The Computer Science and Engineering Department requires that students wait until the first day of instruction to contact instructors about enrolling in their courses.

FEES

Materials Fee

Students should be aware that some laboratory courses require each student to purchase miscellaneous parts or a material kit for completion of the laboratory work. Some laboratory courses may include consumable (one-time use) parts and materials that are distributed to the entire class. Some laboratory kits include parts that the student

will assemble into a project and keep. Please refer to the Baskin Engineering Laboratory Support web page for specific course material-fee amounts.

Miscellaneous Fees

Miscellaneous breakage or loss of equipment fees are assessed to address the cost of damaged laboratory equipment and loss of laboratory materials due to abuse or negligence. This fee is only charged if a student breaks or loses laboratory equipment or materials and is not a mandatory fee charged to all students taking the course. Please refer to the Baskin Engineering Laboratory Support web page for more information.

Applied Mathematics

Baskin School of Engineering
(831) 459-2158
<https://www.soe.ucsc.edu>

PROGRAMS OFFERED

Applied Mathematics B.S. (p. 416)

Applied Mathematics Minor (p. 422)

Scientific Computing and Applied Mathematics
Contiguous Bachelor's/Master's Pathway (p. 424)

Applied Mathematics M.S. (p. 424)

Applied Mathematics Ph.D. (p. 426)

Scientific Computing and Applied Mathematics M.S. (p. 428)

Scientific Computing Designated Emphasis (p. 430)

Applied mathematics is a discipline devoted to the use of mathematical methods and reasoning to solve real-world problems of a scientific or decision-making nature in a wide variety of subjects, principally (but not exclusively) in engineering, medicine, the physical and biological sciences, and the social sciences.

The Applied Mathematics Department at UC Santa Cruz offers a bachelor of science (B.S.) degree in Applied Mathematics, master's and doctoral programs in Applied Mathematics, and a master's program in Scientific Computing and Applied Mathematics (SciCAM). The department also offers a designated emphasis in scientific computing, and an undergraduate minor in applied mathematics.

Additional information on these programs can be found on the department's website.

UNDERGRADUATE PROGRAM

The Department of Applied Mathematics offers a bachelor of science degree in applied mathematics. The goal of the program is to prepare students for careers in

the industry (usually in research and development) or academia (either in teaching and/or in research at university or governmental laboratories or agencies). It can be a terminal degree, or prepare students for graduate school in applied mathematics or related fields.

GRADUATE PROGRAM

The Department of Applied Mathematics offers master's and doctoral programs in applied mathematics, as well as a master's program in scientific computing and applied mathematics, and a designated emphasis in scientific computing.

The goal of the Applied Mathematics graduate program is to help students develop into independent scholars who are prepared for productive careers in research, teaching, and industry. The Master of Science (M.S.) degree may be used as a terminal degree or as the first step toward the associated Doctor of Philosophy degree (Ph.D.).

The goal of the SciCAM M.S. program is primarily to prepare students interested in scientific computing for productive careers in industry. However, it also serves as excellent preparation for students who prefer to pursue an academic career and wish to transfer into a Ph.D. program later, either in scientific computing/applied mathematics, or in a field related to their undergraduate degree.

APPLIED MATHEMATICS B.S.

Information and Policies

Introduction

Applied mathematics is a field of research specializing in the development and application of analytical and numerical tools and techniques toward the solution of complex quantitative problems in science and engineering. A Bachelor of Science (B.S.) in Applied Mathematics prepares graduates for careers in the industry (usually in research and development) or academia (either in teaching and/or in research at university or governmental laboratories or agencies). It can be a terminal degree, or prepare students for graduate school in applied mathematics or related fields.

The applied mathematics major at UC Santa Cruz provides students with a holistic training in mathematical modeling. The core of the degree program includes six courses that introduce modern analytical (and semi-analytical) techniques as well as general aspects of scientific computing. Students gain further depth or breadth by taking three (or more) electives among a large list of upper-division or graduate courses offered by applied mathematics faculty or in related subject areas. Finally, students learn to apply the techniques and tools learned through two capstone courses that focus on modeling "real-life" quantitative problems in science and engineering. In these courses, students also learn additional skills such as mathematical abstraction, critical thinking, and disciplinary communication.

The major has been designed to allow students to easily pursue an additional minor or major in an area of applications of mathematics (such as physics, astrophysics, Earth sciences, computer sciences, computer engineering, electrical engineering), and/or to pursue the 4+1 pathway into the Master of Science (M.S.) degree program in Scientific Computing and Applied Mathematics also offered by the Department of Applied Mathematics.

Academic Advising for the Program

The Baskin School of Engineering (BSOE) Undergraduate Advising Office is located in the Baskin Engineering Building, Room 225. It can be contacted by email at bsoeadvising@ucsc.edu or at the [Undergraduate Advising website](#).

Transfer students to the program should consult the [Transfer Students section](#) of the Baskin Engineering Undergraduate Affairs page.

Getting Started in the Major

It is recommended that high school students intending to apply to this major have completed four years of mathematics (through advanced algebra and trigonometry) and three years of science in high school. Comparable college mathematics and science courses completed at another institution also serve to properly prepare students for these majors

Program Learning Outcomes

Recipients of a B.S. degree in applied mathematics at UC Santa Cruz are expected to have the following skills and experiences:

1. To be able to take a real-life science or engineering problem, and create a mathematical model for it, under the supervision of a professor.
2. To be competent with a number of analytical methods for the solution of linear algebra problems, as well as ordinary and partial differential equations.
3. To be competent with constructing numerical algorithms for the solution of linear algebra problems and ordinary differential equations.
4. To be competent in at least two scientific computing languages such as: Fortran, C, Python, R, Matlab, etc. and to be familiar with other computational elements such as Unix-type operating systems, the use of compilers, professional scientific computing libraries, efficient IO algorithms, data visualization tools, etc.
5. To be able to analyze critically the results from the model obtained, and identify when the model is inappropriate.

6. To be able to communicate clearly and coherently with professionals (orally and/or in writing), in order to: (1) understand what is needed of the mathematical model prior to the investigation; and (2) report on the results of the model after the investigation

Major Qualification Policy and Declaration Process

Major Qualification

In order to be admitted into the applied mathematics major, students must be listed as a proposed major within the School of Engineering or within the Division of Physical and Biological Sciences. Please refer to [Prepare to Declare a BSOE Major](#).

Transfers to the program should consult the [Transfer Students section](#) of the Baskin Engineering Undergraduate Affairs page.

In addition to being listed as a proposed School of Engineering or Physical and Biological Sciences major, admission to the applied mathematics major is based on passing the following foundational courses:

Foundation Courses

One of the following series:

Either these courses		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
or these courses		
MATH 20A	Honors Calculus	5
MATH 20B	Honors Calculus	5

Plus these courses:

AM 30	Multivariate Calculus for Engineers	5
CSE 16	Applied Discrete Mathematics	5

Plus one of the following:

AM 10	Mathematical Methods for Engineers I	5
MATH 21	Linear Algebra	5

Plus one of the following:

AM 20	Mathematical Methods for Engineers II	5
MATH 24	Ordinary Differential Equations	5

Appeal Process

Denials of admission to the major may be appealed by submitting a letter to the School of Engineering Undergraduate Advising office, addressed to the

program undergraduate director within 15 days from the date the notification was mailed. The appeal letter must describe why the prior performance is not an accurate reflection of the student's potential. Within 15 days of receipt of the appeal, the Undergraduate Advising office will notify the student and their college of the decision.

How to Declare a Major

There are four steps to declaring a BSOE major. For a detailed guide to this process, please consult Baskin Engineering's Declare Your Major website.

Students should start the declaration of major process by completing Step One on the BSOE "Declare Your Major" website as soon as they complete the major qualification courses or reach their declaration deadline quarter, whichever comes first.

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed major qualification courses.

Transfer Information and Policy

Transfer Admission Screening Policy

To be considered for admission to the applied mathematics major, incoming transfer students should complete the following courses:

All of the following courses:

AM 10	Mathematical Methods for Engineers I	5
AM 20	Mathematical Methods for Engineers II	5
AM 30	Multivariate Calculus for Engineers	5
CSE 16	Applied Discrete Mathematics	5

Plus one of the following options:

Either these courses		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
or these courses		
MATH 20A	Honors Calculus	5
MATH 20B	Honors Calculus	5

Getting Started at UCSC as a Transfer Student

Transfer students should declare their major in their first quarter at UC Santa Cruz. Instructions for declaring a major in the Baskin School of Engineering are on the department's major declaration page.

Letter Grade Policy

The Baskin School of Engineering requires letter grades for all courses in an engineering major.

[Optional Catchall]

Course Substitution Policy

Undergraduate engineering students who wish to substitute a major course with a course from UC Santa Cruz must first consult the School of Engineering Undergraduate Advising Office. The advising office requires a Petition for Course Substitution be approved before credit for an alternate course can be applied to any School of Engineering major requirement. Petition forms are available at the undergraduate advising office and on the SoE advising website.

Petitions and procedures for approval must be obtained from and submitted to the Undergraduate Advising Office.

Double Major Policy

Students who are planning a double-major with physics can replace the AM 100, AM 112 and STAT 131 (or CSE 107) courses with the PHYS 116A, PHYS 116B, and PHYS 116C series. Special approval by both undergraduate directors will be required to do so.

Education Abroad Program (EAP)

Honors

Students must obtain a GPA of 3.8 or higher in the courses in the major to be considered for the distinction of "Highest Honors in the Major." Students must obtain a GPA of 3.5 or higher in the courses in the major to be considered for the distinction of "Honors in the Major." The School of Engineering reserves the right to withhold honors based on other criteria, such as an incident of academic dishonesty.

School of Engineering Policies

Please refer to the School of Engineering's Admission to School of Engineering Majors section of the catalog for additional policies that apply to all School of Engineering programs. These policies include admission to the major and the need for students to obtain preapproval before taking courses elsewhere.

Requirements and Planners

Course Requirements

Course requirements are divided into foundational lower-division courses and advanced upper-division courses:

Lower-Division Courses

Choose one of the following series:

Either these courses

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
or these courses		
MATH 20A	Honors Calculus	5
MATH 20B	Honors Calculus	5

Credit for one or both MATH 19A and MATH 19B may be granted with adequate performance on the CEEB calculus AB or BC Advanced Placement examinations.

Plus one of the following courses:

AM 10	Mathematical Methods for Engineers I	5
MATH 21	Linear Algebra	5

AM 10 is preferred.

Plus one of the following courses:

AM 20	Mathematical Methods for Engineers II	5
MATH 24	Ordinary Differential Equations	5

AM 20 is preferred.

Plus one of the following options:

AM 30	Multivariate Calculus for Engineers	5
or these courses		
MATH 23A	Vector Calculus	5
MATH 23B	Vector Calculus	5

AM 30 is preferred.

Plus the following course:

CSE 16	Applied Discrete Mathematics	5
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Plus one of the following programming courses

CSE 20	Beginning Programming in Python	5
CSE 13S	Computer Systems and C Programming	7
ECE 13	Computer Systems and C Programming	7

The programming requirement can be satisfied if students have a prior programming course, AP credit, or clearing the “Test-out” bar.

Lower-Division Electives

Students are required to take two lower-division electives from the following list, in preparation for the upper-division electives they are later required to take. Students are encouraged to plan ahead carefully in consultation with undergraduate advising in making their selection.

EART, ECE, PHYS lower-division electives

Students interested in EART, ECE, PHYS upper-division electives should consider taking some of the following PHYS lower-division electives:

PHYS 5A	Introduction to Physics I	5
PHYS 5B	Introduction to Physics II	5
PHYS 5C	Introduction to Physics III	5
PHYS 6A	Introductory Physics I	5
PHYS 6B	Introductory Physics II	5
PHYS 6C	Introductory Physics III	5

Only one course out of PHYS 5A and PHYS 6A, one course out of PHYS 5B and PHYS 6B, and one course out of PHYS 5C and PHYS 6C can be taken. Several of these courses have corequisite lab courses.

CSE or ECE lower-division electives

Students interested in CSE or ECE upper-division electives should consider taking some of the following CSE or ECE lower-division electives (in addition to possible PHYS electives):

CSE 30	Programming Abstractions: Python	7
ECE 9	Statics and Mechanics of Materials	5

ECON lower-division electives

Students interested in ECON upper-division electives should consider taking some of the following ECON or STAT lower-division electives:

ECON 1	Introductory Microeconomics: Resource Allocation and Market Structure	5
ECON 2	Introductory Macroeconomics: Aggregate Economic Activity	5
STAT 5	Statistics	5

Lower-division electives for mathematical biology

Students interested in mathematical biology (in particular AM 115) should consider taking some of the following BIOL or BIOE lower-division electives:

BIOL 20A	Cell and Molecular Biology	5
BIOE 20C	Ecology and Evolution	5

Upper-Division Courses

Complete the following core courses:

AM 100	Mathematical Methods for Engineers	5
AM 129	Foundations of Scientific Computing for Scientists and Engineers	5
AM 147	Computational Methods and Applications	5

Plus one of the following courses:

AM 112	Introduction to Partial Differential Equations	5
AM 212A	Applied Partial Differential Equations	5

Plus one of the following courses:

AM 114	Introduction to Dynamical Systems	5
AM 214	Applied Dynamical Systems	5

Plus one of the following courses:

STAT 131	Introduction to Probability Theory	5
CSE 107	Probability and Statistics for Engineers	5

Students who intend to pursue an M.S. degree in scientific computing and applied mathematics later are strongly encouraged to take the AM 212A and AM 214 options instead of AM 112 and AM 114.

Upper-Division Electives

Students are required to take three upper-division elective courses from the following list of possible electives. Note that many of these electives have lower-division prerequisites. Students should plan carefully which ones to take to ensure they are prepared for their selected upper-division electives. Also note that enrollment in the graduate courses is by permission of the instructor, who will verify adequate preparation.

Possible AM Electives

Any 5-credit upper-division AM course that is not already a core course. Any 5-credit graduate AM course **with the exception** of AM 200, AM 211, AM 212A and AM 214.

Possible CSE Electives

Note that many require lower-division CSE courses. Lecture-lab combinations count as one course.

CSE 101	Introduction to Data Structures and Algorithms	5
CSE 102	Introduction to Analysis of Algorithms	5
CSE 106	Applied Graph Theory and Algorithms	5
CSE 140	Artificial Intelligence	5
CSE 142	Machine Learning	5
CSE 144	Applied Machine Learning	5
CSE 160	Introduction to Computer Graphics	5
CSE 160L	Introduction to Computer Graphics Laboratory	2
CSE 161	Introduction to Data Visualization	5
CSE 161L	Data Visualization Laboratory	2
CSE 162	Advanced Computer Graphics and Animation	5

CSE 162L	Advanced Computer Graphics and Animation Laboratory	2
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Note that most of these courses require CSE 101 as prerequisite and that enrollment restrictions vary and might apply to any of the CSE courses listed here on short notice. CSE 101, CSE 102, CSE 140, CSE 142, CSE 144 are courses for which enrollment restrictions may apply, and that may only be appropriate for double-majors (or major-minor combinations). CSE 162 & CSE 162L is a course that has more than one upper-division prerequisite beyond those that are already part of the core requirements. This course may only be appropriate for double-majors (or major-minor combinations).

Possible EART Electives

Note that many require lower-division PHYS or CHEM courses:

EART 124	Modeling Earth's Climate	5
EART 160	Planetary Science	5
EART 162	Planetary Interiors	5

Either of the following courses:

EART 125	Statistics and Data Analysis in the Geosciences	5
EART 225	Statistics and Data Analysis in the Geosciences	5

Either of the following courses:

EART 172	Geophysical Fluid Dynamics	5
EART 272	Geophysical Fluid Dynamics	5

Possible ECE Electives

Lecture-lab combinations count as one course.

ECE 101	Introduction to Electronic Circuits	5
ECE 101L	Introduction to Electronic Circuits Laboratory	2
ECE 103	Signals and Systems	5
ECE 115	Introduction to Solid Mechanics	5
ECE 135	Electromagnetic Fields and Waves	5
ECE 135L	Electromagnetic Fields and Waves Laboratory	2
ECE 141	Feedback Control Systems	5
ECE 153	Digital Signal Processing	5

Note that most of these courses require ECE 101 as prerequisite. ECE 141 and ECE 153 are courses that have more than one upper-division prerequisite beyond those that are already part of the core requirements. These courses may only be appropriate for double-majors (or major-minor combinations).

Possible ECON Electives

Note that many require ECON lower-division courses:

ECON 100M	Intermediate Microeconomics, Math Intensive	5
ECON 100N	Intermediate Macroeconomics, Math Intensive	5
ECON 113	Introduction to Econometrics	5
ECON 166A	Game Theory and Applications I	5

ECON 166A is a course that has more than one upper-division prerequisite beyond those that are already part of the core requirements. This course may only be appropriate for double-majors (or major-minor combinations).

Possible MATH Electives

MATH 105A	Real Analysis	5
MATH 110	Introduction to Number Theory	5
MATH 111A	Algebra	5
MATH 111T	Algebra	5
MATH 115	Graph Theory	5
MATH 116	Combinatorics	5
MATH 117	Advanced Linear Algebra	5
MATH 118	Advanced Number Theory	5
MATH 120	Coding Theory	5
MATH 134	Cryptography	5
MATH 160	Mathematical Logic I	5

Note that many MATH electives require MATH 100 as a prerequisite.

Possible OCEA Electives

Note that some require lower-division PHYS electives, or upper-division ESCI electives:

OCEA 260	Introductory Data Analysis in the Ocean and Earth Sciences	5
OCEA 286	Introduction to Ocean Modeling	5

Either of the following courses:

OCEA 100	Physical Oceanography	5
OCEA 200	Physical Oceanography	5

Either of the following courses:

OCEA 111	Climate Dynamics	5
OCEA 211	Climate Dynamics	5

Possible PHYS Electives

Note that many require lower-division PHYS courses:

PHYS 105	Mechanics	5
PHYS 110A	Electricity, Magnetism, and Optics	5

PHYS 110B	Electricity, Magnetism, and Optics	5
PHYS 139A	Quantum Mechanics I	5
PHYS 139B	Quantum Mechanics II	5
PHYS 150	Quantum Computing	5
PHYS 171	General Relativity, Black Holes, and Cosmology	5

The prerequisites of PHYS 116A, PHYS 116B, and PHYS 116C is waived for students who have taken AM 100 and AM 112 and STAT 131 (or CSE 107).

PHYS 139A, PHYS 139B, PHYS 171 are courses that have more than one upper-division prerequisite beyond those that are already part of the core requirements. These courses may only be appropriate for double majors (or major-minor combinations).

Possible STAT Electives

STAT 132	Classical and Bayesian Inference	5
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Disciplinary Communication (DC) Requirement

The DC requirement in the Applied Mathematics B.S. is satisfied by completing the capstone course AM 170A (see below).

Comprehensive Requirement

Students satisfy the senior comprehensive requirement by receiving a passing grade in the two Mathematical Modeling courses:

AM 170A	Mathematical Modeling 1	5
AM 170B	Mathematical Modeling 2	5

Planners

The following are four sample academic plans that students can use to plan their sequence of courses in the major. The first two plans are suggested guidelines for students who begin their studies in their frosh year. Such students, if they plan carefully, will have several openings free to take other breadth courses they find interesting, or pursue an additional minor or major. The other two plans are for students transferring to UC Santa Cruz as juniors.

Plan One: This planner is for a student entering UCSC in their frosh year who is prepared to go directly into MATH 19A or MATH 20A.

	Fall	Winter	Spring
1st Year	MATH 19A	CSE 20	AM 20
	AM 10	Lower div elective	CSE 16
		MATH 19B	
2nd Year	AM 30		STAT 131
		Lower-div elective	

3rd Year	AM 100	AM 170A	Upper-div elective
	AM 114	AM 112	
	Upper-div elective		
4th Year	AM 129	AM 147	AM 170B
	Upper-div elective		

The SI general education requirement is satisfied by passing the capstone course AM 170B. The MF general education requirement is satisfied by passing any of the lower-division mathematical foundations requirements.

Plan Two: This planner is for a student entering UCSC their frosh year who needs to take preparatory courses prior to MATH 19A to ensure a successful outcome in this course.

	Fall	Winter	Spring
1st Year	MATH 2	MATH 3	MATH 19A
		Lower div elective	Lower div elective
2nd Year	AM 10	AM 20	AM 30
	MATH 19B	CSE 20	CSE 16
3rd Year	AM 100	AM 112	
	AM 114	STAT 131	Upper-div elective
	Upper-div elective		
4th Year	AM 129	AM 147	AM 170B
	Upper-div elective	AM 170A	

The SI general education requirement is satisfied by passing the capstone course AM 170B. The MF general education requirement is satisfied by passing any of the lower-division mathematical foundations requirements.

Plan Three: This is a sample planner for a transfer student. It assumes the student has taken the majority of their general education requirements prior to joining UCSC.

	Fall	Winter	Spring
Junior Year	CSE 20	AM 112	Upper-div elective
	AM 100	STAT 131	

	Lower-div elective	Lower-div elective	
Senior Year	AM 114	AM 170A	AM 170B
	AM 129	AM 147	
	Upper-div elective	Upper-div elective	

Plan Four: This is a sample planner for a transfer student interested in the 4+1 program (e.g. thesis track; replace Independent Study with M.S. elective for coursework track). Note that students **must** take the graduate version of PDEs and Dynamical Systems courses (212A and 214 respectively) to count toward the M.S. core requirements. One additional elective must be taken during the M.S. year to ensure that there are at least 35 credits taken as a graduate student.

	Fall	Winter	Spring
Junior Year	CSE 20	AM 212A	Upper-div elective
	AM 100	STAT 131	
	Lower-div elective	Lower-div elective	
Senior Year	AM 129	AM 147	AM 170B
	AM 214	AM 170A	Upper-div elective
	Upper-div elective		
M.S. Year	M.S. elective	AM 213A	AM 213B
	M.S. elective		AM 250
	Indep Study	Indep Study	

APPLIED MATHEMATICS MINOR

The applied mathematics minor is available for students who wish to develop (1) proficiency in modeling real-life problems using mathematics and (2) knowledge of standard, practical analytical and numerical methods for the solution of these models. This minor could be combined with a major in any of the physical, biological, mathematical, or engineering sciences as preparation for a graduate degree in that field or in applied mathematics.

Course Requirements

Lower-Division Courses

Basic calculus sequence:

Either these courses		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
or these courses		
MATH 20A	Honors Calculus	5
MATH 20B	Honors Calculus AND	5
Either these courses		
MATH 23A	Vector Calculus	5
MATH 23B	Vector Calculus	5
or these courses		
AM 30	Multivariate Calculus for Engineers	5
AM 100	Mathematical Methods for Engineers	5

Upper-Division Courses

Complete one of the following sequences:

Either these courses		
AM 10	Mathematical Methods for Engineers I	5
AM 20	Mathematical Methods for Engineers II	5
or these courses		
MATH 21	Linear Algebra	5
MATH 24	Ordinary Differential Equations	5
or this course		
PHYS 116A	Mathematical Methods in Physics	5

Note: Students who complete MATH 21 and MATH 24 or PHYS 116A are strongly recommended to complete the MATLAB self-paced tutorial.

Plus one course from each of the following categories:

Students interested in later pursuing an M.S. degree in [scientific computing and applied mathematics](#), or in [applied mathematics](#), are strongly encouraged to take the graduate courses AM 212A and AM 214 instead of the undergraduate courses AM 112 and AM 114.

Probability Theory

CSE 107	Probability and Statistics for Engineers	5
STAT 131	Introduction to Probability Theory	5

Dynamical Systems:

AM 114	Introduction to Dynamical Systems	5
AM 214	Applied Dynamical Systems	5

Introduction to Numerical Methods:

AM 147	Computational Methods and Applications	5
PHYS 115	Computational Physics	5

Partial Differential Equations:

AM 112	Introduction to Partial Differential Equations	5
AM 212A	Applied Partial Differential Equations	5
PHYS 116C	Mathematical Methods in Physics	5
MATH 107	Partial Differential Equations	5

Plus one applied-mathematics elective from the following list:

AM 107	Introduction to Fluid Dynamics	5
AM 115	Stochastic Modeling in Biology	5
AM 129	Foundations of Scientific Computing for Scientists and Engineers	5
AM 198	Independent Study or Research	5
AM 212B	Applied Mathematical Methods II	5
AM 213A	Numerical Linear Algebra	5
AM 213B	Numerical Methods for the Solution of Differential Equations	5
AM 215	Stochastic Modeling in Biology	5
AM 216	Stochastic Differential Equations	5
AM 217	Introduction to Fluid Dynamics	5
AM 231	Nonlinear Control Theory	5
AM 232	Applied Optimal Control	5
AM 250	An Introduction to High Performance Computing	5
ECE 103	Signals and Systems	5
ECE 115	Introduction to Solid Mechanics	5
ECE 141	Feedback Control Systems	5
MATH 103A	Complex Analysis	5
MATH 117	Advanced Linear Algebra	5
MATH 121A	Differential Geometry	5
PHYS 105	Mechanics	5
PHYS 139A	Quantum Mechanics I	5
PHYS 139B	Quantum Mechanics II	5
PHYS 171	General Relativity, Black Holes, and Cosmology	5

STAT 132	Classical and Bayesian Inference	5
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Students may also propose other electives which use applied mathematical methods, subject to approval by the department.

SCIENTIFIC COMPUTING AND APPLIED MATHEMATICS CONTIGUOUS BACHELOR'S/MASTER'S PATHWAY

4+1 CONTIGUOUS PATHWAY LEADING TO THE SCICAM M.S.

Degree

The 4+1 pathway into the SciCAM M.S. program is an option that allows undergraduates at UC Santa Cruz to (1) take the SciCAM foundational courses during their undergraduate degree in preparation to join the 1-year track of the SciCAM program, and (2) apply to SciCAM through a streamlined application process. Undergraduate students currently enrolled in approved programs (currently, the B.S. in applied mathematics, the B.A. in mathematics, the B.S. in computer science, the B.S. in robotics engineering, the B.S. in physics, the B.S. in applied physics and the B.S. in physics [astrophysics]) have the opportunity, any time between the start of their junior year and the end of the fall quarter of their senior year, to join the 4+1 contiguous pathway leading to the SciCAM degree program. Qualified undergraduates from other undergraduate majors may also apply to the pathway and their applications will be considered on a case by case basis.

Admission Requirements

The requirements for admission into the 4+1 pathway are (1) a cumulative GPA of 3.3 or more, and (2) to have taken, or to have a plan to take, at least two of the three SciCAM foundational courses before the end of their senior year. Note that some of the foundational courses are waived depending on the student's major. Interested students should set up a meeting with the SciCAM adviser to discuss their curriculum plan and fill the application form. The ultimate deadline for application to the pathway is the end of the fall quarter of the senior year, although students are encouraged to apply significantly earlier, ideally at the same time as their major declaration.

Students in the pathway who apply to SciCAM through the streamlined application process are not guaranteed admission, although we do expect to admit anyone who has passed all the foundational courses and has maintained a GPA of 3.3 or more. Once accepted into the SciCAM program, students from the pathway will follow

the same requirements as any other students in the one-year track with anticipated graduation in June of their 5th year for Plan II (comprehensive exam track) students, and the end of the summer of their fifth year for Plan I (thesis track) students. Note that while students would normally begin their M.S. year in the fall quarter, a winter start is possible for students with anticipated B.S. graduation in the fall. This is considered on a case-by-case basis only. Winter-start students then graduate from the M.S. at the end of the calendar year

Relationship of SciCAM Masters program and AM Doctoral Program

Students in the SciCAM M.S. program interested in an academic career will be strongly encouraged to apply to the AM Ph.D. program. Applications are reviewed in the standard academic cycle, so that students interested in applying to the AM Ph.D. program are encouraged to discuss this option with the graduate director in the fall of each year.

Transfer Credit

Up to three UCSC courses (15 credits) fulfilling the degree requirements of the SciCAM degree may be taken before beginning the graduate program. However, students will still need to take courses totaling 35 credits as graduate students to satisfy university requirements. Note that this limit does not apply to the foundational requirements, which may all be taken prior to the start of the SciCAM program without penalty.

Up to one course from other institutions may be applied to the M.S. degree course requirements. Petitions should be submitted along with the transcript from the other institution or UCSC Extension. For courses taken at other institutions, copies of the syllabi, exams, and other course work should accompany the petition. Such petitions are not considered until the completion of at least one quarter at UCSC.

Review of Progress

Each year, the faculty reviews the progress of every student in all programs and tracks. Students not making adequate progress toward completion of degree requirements are subject to dismissal from the program (see the Graduate Handbook for the policy on satisfactory academic progress).

APPLIED MATHEMATICS M.S.

Introduction

Graduate studies in applied mathematics (AM) at UC Santa Cruz focus on developing skillsets in mathematical modeling, analysis, and scientific computation applied to a broad range of science and engineering disciplines, including fluid mechanics, mathematical biology, dynamical systems, stochastic processes, control, and optimization. The overarching goal of the AM graduate programs at UCSC is to underscore the application of

mathematics in solving real-life problems. In particular, the master of science (M.S.) program is designed to prepare the students for professional careers in applied domains requiring mathematical skillsets.

This is a Plan II capstone M.S. program.

Requirements

Course Requirements

Core Courses

All AM M.S. students must complete the following core courses. All non-seminar core courses must be taken for letter grades.

AM 212A	Applied Partial Differential Equations	5
AM 213A	Numerical Linear Algebra	5
AM 213B	Numerical Methods for the Solution of Differential Equations	5
AM 214	Applied Dynamical Systems	5
AM 280B	Seminar in Applied Mathematical Modeling	2

Elective Courses

In addition to these 22 credits, M.S. students must complete four additional 5-credit courses for a total requirement of 42 credits. As part of the four additional courses, students are required to take (at least) one elective course (first-year elective) during their first year. First-year electives are designed to prepare students for their ultimate research emphasis within applied mathematics. They must be taken during the first year, and must be selected from the following list, with approval from the student's official advisor:

AM 129	Foundations of Scientific Computing for Scientists and Engineers	5
AM 215	Stochastic Modeling in Biology	5
AM 216	Stochastic Differential Equations	5
AM 217	Introduction to Fluid Dynamics	5
AM 227	Waves and Instabilities in Fluids	5
AM 229	Convex Optimization	5
AM 230	Numerical Optimization	5
AM 231	Nonlinear Control Theory	5
AM 232	Applied Optimal Control	5
AM 238	Fundamentals of Uncertainty Quantification in Computational Science and Engineering	5
AM 250	An Introduction to High Performance Computing	5
AM 260	Computational Fluid Dynamics	5
AM 275	Magnetohydrodynamics	5

STAT 203	Introduction to Probability Theory	5
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M.S. Project Requirements

A capstone project is required for the M.S. degree.

For the M.S. degree, students will conduct a capstone research project. Students must submit a proposal to the potential faculty sponsor. If the proposal is accepted, the faculty member will become the sponsor and will supervise the research and writing of the project. The project will involve the solution of a problem or problems from the selected area of application. When the project is completed and written, it will be submitted to and must be accepted by a committee of two ladder-rank faculty members, consisting of the faculty adviser and one additional reader. At least one of these core two readers must be from within the Applied Mathematics Department. Additional readers will be chosen appropriately from within the Applied Mathematics Department or outside of it. Either the adviser or the additional reader must be from within the Applied Mathematics Department.

Relationship of AM Master's Program and AM Doctoral Program

The M.S. and Ph.D. programs are freestanding and independent, so that students can be admitted to either. Students completing the M.S. program may request to transfer into the Ph.D. program (provided they pass the pre-qualifying examination), and students in the Ph.D. program can receive a non-terminal M.S. degree upon completion of M.S. requirements, including the capstone research project.

Transfer Credit

Up to three School of Engineering courses (15 credits) fulfilling the degree requirements of the M.S. degree may be taken during students' undergraduate study at UC Santa Cruz. Courses from other institutions may not be applied to the M.S. degree course requirements.

Petitions should be submitted along with the transcript from their UC Santa Cruz undergraduate study. Such petitions are not considered until the completion of at least one quarter at UC Santa Cruz. At most, a total of three courses may be transferred.

Students who complete the M.S. degree in AM at UC Santa Cruz and continue on to the Ph.D. program in AM at UCSC can transfer all applicable courses taken during the M.S. to the Ph.D. program, provided that such students meet the minimum residency requirement for Ph.D. programs, as specified by the UCSC Graduate Division.

Foreign Language Requirements**Review of Progress**

Each year, the faculty reviews the progress of every student in all programs and tracks. Students not making adequate progress toward completion of degree requirements are subject to dismissal from the program (see the UC Santa Cruz Graduate Handbook and the AM Graduate Handbook for the policy on satisfactory academic progress). Also, please refer to specific guidelines on the annual student reviews.

Applying for Graduation

All candidates for a degree must submit an application for the M.S. degree to the Graduate Student Affairs Office by the date stated in the Academic and Administrative Calendar for the quarter they wish to receive the degree. The deadline for degree applications is typically in the second week of the quarter. A student is required to be registered during the quarter in which the degree is conferred. For more information about applying for graduation, visit the Baskin School of Engineering Graduate Studies website.

APPLIED MATHEMATICS PH.D.**Introduction**

Graduate studies in applied mathematics (AM) at UC Santa Cruz focus on developing skillsets in mathematical modeling, analysis, and scientific computation applied to a broad range of science and engineering disciplines, including fluid mechanics, mathematical biology, dynamical systems, stochastic processes, control, and optimization. The overarching goal of the AM graduate programs at UCSC is to underscore the application of mathematics in solving real-life problems. In particular, the doctor of philosophy (Ph.D.) program prepares the students with the foundational tools of applied mathematics, enabling them to perform independent research that transcends the disciplinary boundaries in science and engineering.

Advancement to Candidacy**Course Requirements****Foundational Courses**

Students in the AM Ph.D. program must demonstrate mastery in the foundations of scientific computing and applied mathematics, either by producing evidence through undergraduate transcripts or by taking all of the following foundational courses upon entry to the Ph.D. program, or a combination of the two, by the end of their first year:

All of the following three courses

AM 129	Foundations of Scientific Computing for Scientists and Engineers	5
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AM 100	Mathematical Methods for Engineers	5
AM 147	Computational Methods and Applications	5

Core Courses

All AM Ph.D. students must complete the following core courses (non-seminar). All non-seminar core courses must be taken for letter grades. The AM 280 seminar series (i.e., AM 280A, AM 280B, and AM 280C) needs to be taken at least three times in a combination of the three courses. The combination must include at least one time of AM 280B.

AM 212A	Applied Partial Differential Equations	5
AM 213A	Numerical Linear Algebra	5
AM 213B	Numerical Methods for the Solution of Differential Equations	5
AM 214	Applied Dynamical Systems	5
AM 280A	Seminar in Mathematical and Computational Biology	2
AM 280B	Seminar in Applied Mathematical Modeling	2
AM 280C	Seminar in Geophysical and Astrophysical Fluid Dynamics	2

Elective Courses

In addition to these 26 credits, Ph.D. students must complete six additional 5-credit courses for a total requirement of 56 credits. As part of the six additional courses, students are required to take (at least) one elective course (first-year elective) during their first year to help them engage in research as early as possible. First-year electives are designed to prepare students for their ultimate research emphasis within applied mathematics. These electives can be selected from any 5-credit AM graduate courses (level 200 or above), with approval from the student's official advisor.

Ph.D. students who already have an M.S. degree (or equivalent) will be allowed to substitute up to two elective courses with corresponding numbers of credits of independent study (i.e., 5 or 10), during which they conduct research with their advisor toward their advancement to candidacy.

All elective courses, including the AM courses and non-AM courses, must be approved by the student's official advisor or the graduate director.

Transfer Credit

Up to three School of Engineering courses fulfilling the degree requirements of the Ph.D. degree may be taken during students' undergraduate study at UC Santa Cruz. Ph.D. students who have previously earned an M.S. degree in a related field at another institution may substitute courses from their previous university with the approval of the advisor and the graduate committee.

Petitions should be submitted along with the transcript from the other institution or from their UCSC undergraduate study. For courses taken at other institutions, copies of the syllabi, exams, and other course work should accompany the petition. Such petitions are not considered until the completion of at least one quarter at UCSC. At most, a total of three courses may be transferred.

Students who complete at UCSC the M.S. degree in AM or the M.S. degree in Scientific Computing and Applied Mathematics (SciCAM) and continue on to the Ph.D. program in AM at UCSC can transfer all applicable courses taken during the M.S. to the Ph.D. program, provided that such students meet the minimum residency requirement for Ph.D. programs, as specified by the UCSC Graduate Division.

Foreign Language Requirements

Teaching Requirement

Ph.D. students will be required to serve as teaching assistants for at least two quarters during their graduate study. Certain exceptions may be permitted for those with extensive prior teaching experience, for those who are not allowed to be employed due to visa regulations, or for other reasons approved by the graduate director.

Ph.D. students whose native language is not English must take the Test of English as a Foreign Language (TOEFL) exam or the International English Language Testing System (IELTS) exam and score a minimum of 26 on the spoken portion of the Internet-based TOEFL or an overall 8 on the IELTS before being considered for a position of teaching assistant. The English-language requirement for teaching assistants is waived for students who have received a degree from an English-speaking institution or have lived in the United States for more than four years. International students may also participate in the Graduate Preparation Program (GPP) prior to starting the graduate program. Successful completion of the GPP satisfies the English-language requirement for teaching assistants.

Pre-Qualifying Requirements

At the end of the first year, all Ph.D. students will take a pre-qualifying examination covering the (non-seminar) core courses. This examination is a take-home project involving analysis, simulations, and writing a formal written report. Ph.D. students who do not pass this examination will be allowed to retake it before the start of the following fall quarter; if they fail the second examination they will not be allowed to continue in the Ph.D. program but will have the option to continue into the M.S. program and exit with the M.S. as the terminal degree.

After passing the pre-qualifying examination, a Ph.D. student must form an advisory committee by the end of the fall quarter of the student's second year. The advisory committee consists of two or more ladder-rank faculty members and must include one ladder-rank faculty from

within the Applied Mathematics Department. The student shall meet with the advisory committee annually until the advancement.

Qualifying Examination

Ph.D. students must complete the oral proposal defense, through which they advance to candidacy, by the end of the spring quarter of their third year. The proposal defense is a public seminar followed by an oral qualifying examination given by the qualifying committee. The student's oral presentation must be approximately 45 minutes in length. Applied mathematics students will also be required to submit a substantial written document to the qualifying examination committee, describing their research to date as well as their Ph.D. proposal ahead of time.

Students will advance to candidacy after they have completed all course requirements (including removal of all incomplete grades), passed the pre-qualifying examination and the qualifying examination, nominated their dissertation reading committee, and paid the advancement to candidacy fee. Under normal progress, a student will advance to candidacy by the end of the spring quarter of the student's third year. A student who has not advanced to candidacy by the start of the fourth year will be subject to academic probation.

Dissertation

Upon successful completion of the qualifying examination, a dissertation reading committee will be formed, consisting of the dissertation supervisor and at least two additional readers appointed by the graduate director upon recommendation of the dissertation supervisor. At least one of these additional readers must be a ladder-rank faculty in the Applied Mathematics Department. The committee is subject to the approval of the Graduate Division. The third reader is to be a ladder-rank UC Santa Cruz faculty or a recognized expert in the student's research area with credentials equivalent to a ladder-rank UCSC faculty member as judged by the Graduate Director and the Dean of Graduate Studies. At least two members of the committee must be AM faculty.

Post-Qualifying Requirements

After the advancement, a Ph.D. student shall meet with the dissertation committee annually to present and discuss progress made, and receive comments/suggestions from committee members.

Relationship of AM Master's Program and AM Doctoral Program

The M.S. and Ph.D. programs are freestanding and independent, so that students can be admitted to either program. Students completing the M.S. program may request to transfer into the Ph.D. program (provided they pass the pre-qualifying examination), and students in the Ph.D. program can receive a non-terminal M.S. degree upon completion of M.S. requirements, including the capstone research project. Each Ph.D. student will be

required to have knowledge of applied mathematics equivalent to that required for the M.S. degree. In addition, Ph.D. candidates will be required to complete coursework beyond the M.S. level.

Dissertation

Dissertation

A dissertation is required for the Ph.D. degree. The dissertation will consist of a minimum of three chapters composed of material suitable for submission and publication in major professional journals in applied mathematics (or related subject areas of application).

Dissertation Defense

The completed dissertation will be submitted to the reading committee at least one month before the dissertation defense, which consists of a public presentation of the research followed by a private examination by the reading committee. Successful completion of the dissertation defense is the final requirement for the Ph.D. degree.

Academic Progress

Each year, the faculty reviews the progress of every student in the graduate programs. Students not making adequate progress toward completion of degree requirements are subject to dismissal from the program (see the UC Santa Cruz Graduate Handbook and the AM Graduate Handbook for the policy on satisfactory academic progress). Also, please refer to specific guidelines on the annual student reviews.

Applying for Graduation

All candidates for a degree must submit an application for the Ph.D. degree to the Graduate Advising Office by the date stated in the Academic and Administrative Calendar for the quarter you wish to receive the degree. Failure to declare candidacy by the deadline means that you cannot be considered a candidate until the next term.

A student is required to be registered or on Filing Fee Status, whichever is applicable, during the quarter in which the degree is conferred. Students should consult the department advisor to determine which option fits their situation. For more information about applying for graduation, visit the Baskin School of Engineering Graduate Studies website.

SCIENTIFIC COMPUTING AND APPLIED MATHEMATICS M.S.

Introduction

The Department of Applied Mathematics offers an M.S. program in Scientific Computing and Applied Mathematics (SciCAM). SciCAM students learn a combination of cutting-edge computational methods for modern high-performance computing architectures and

applied mathematical modeling. The SciCAM M.S. degree is ideal for meeting the increasing need for graduates in the rapidly growing markets of computational mathematics and modeling and high-performance computing. Such computationally knowledgeable and experienced modelers are highly sought after in industry and government agencies.

Requirements

Course Requirements

Foundational Courses

Students in the SciCAM program must also demonstrate mastery in the foundations of scientific computing and applied mathematics, either by producing evidence through undergraduate transcripts or by taking some or all of the following foundational courses upon entry to the M.S. program:

All of the following three courses:

AM 129	Foundations of Scientific Computing for Scientists and Engineers	5
AM 100	Mathematical Methods for Engineers	5
AM 147	Computational Methods and Applications	5

Core Courses

All SciCAM M.S. students are required to take the core courses listed below.

AM 212A	Applied Partial Differential Equations	5
AM 213A	Numerical Linear Algebra	5
AM 213B	Numerical Methods for the Solution of Differential Equations	5
AM 214	Applied Dynamical Systems	5
AM 250	An Introduction to High Performance Computing	5

All non-seminar core courses must be taken for letter grades.

Electives

Any 5-credit AM graduate courses (200 or above) not already listed as a core course can be counted as electives with approval from the student's official advisor or the graduate director. Also, elective courses outside of AM must be approved by the student's official advisor or the graduate director.

Note that some upper-division electives are allowed, bearing in mind that no more than a total of 15 credits of upper-division courses may be used to satisfy the degree requirements.

Other Requirements

Students in the SciCAM program may pursue either a **Plan I thesis** or **Plan II capstone (comprehensive examination)** curriculum.

- Candidates for a Plan I thesis** must complete one elective and take a minimum of two-quarters of independent study to write a thesis. The thesis requirements are as follows. Students must submit a thesis proposal to the potential faculty sponsor after completion of all core courses. If the proposal is accepted, the faculty member will become the sponsor and will supervise the research and writing of the thesis project. The project will involve the solution of a problem or problems from the selected area of application. The thesis must consist of at least 30 pages and no more than 60 pages of printed written work and accompanying pertinent figures, consisting of a coherent introduction and presentation of the current state of the field, a clear presentation of the questions raised, of the methodology used to solve them, and a discussion of the results obtained. The thesis will be read by a committee of three ladder-rank faculty members, consisting of the faculty advisor and two additional readers. Additional readers will be chosen appropriately from within the Applied Mathematics Department or outside of it. At least two members of the reading committee must be from within the Applied Mathematics Department. The student will then be required to give a short (20-minute) public oral presentation of their thesis, which will be evaluated by the reading committee. The reading committee will assess the quality of both written work and oral presentation in making their recommendation for awarding the SciCAM M.S. degree to the student.
- Candidates for a Plan II capstone (comprehensive examination)** must complete three electives and pass the SciCAM comprehensive examination. The exam takes place in June at the end of the academic year. Students may only take this exam following completion of the last core course. The exam will take the form of a take-home exam covering all core and foundational courses. Passing the comprehensive examination fulfills the capstone requirement. A student will have two attempts to pass the exam.

Accelerated One-Year Program Plan

The expected time to completion of the SciCAM M.S. degree program is two years. However, AM also offers a one-year accelerated track for interested students who can demonstrate sufficient proficiency in the foundational subjects. The minimum requirements to join the accelerated track are:

- having completed at least three calculus courses, including multivariate differential and integral calculus,

- having completed a course on ordinary differential equations, a course on linear algebra, and a course on programming, and
- having completed at least two of the three foundational requirement courses of the SciCAM program or their equivalents.

Requests to join the accelerated track must be made to the graduate director by email no later than Aug. 31 of each year.

Transfer Credit

Up to three UC Santa Cruz courses (15 credits) fulfilling the degree requirements of the SciCAM M.S. degree may be taken during students' undergraduate study at UCSC. However, students will still need to take courses totaling 35 credits as graduate students to satisfy university requirements. Note that this limit does not apply to the foundational requirements, which may all be taken prior to the start of the SciCAM program without penalty.

Up to one course from other institutions may be applied to the SciCAM M.S. degree course requirements.

Petitions should be submitted along with the transcript from the other institution or UCSC Extension. For courses taken at other institutions, copies of the syllabi, exams, and other course work should accompany the petition. Such petitions are not considered until the completion of at least one quarter at UCSC.

Relationship of SciCAM Master's Program and AM Doctoral Program

Students in the SciCAM M.S. program interested in an academic career will be strongly encouraged to apply to the AM Ph.D. program. Applications are reviewed in the standard academic cycle. Students interested in applying to the AM Ph.D. program are encouraged to discuss this option with the graduate director in the fall of each year.

Review of Progress

Each year, the faculty review the progress of every student in all graduate programs. Students not making adequate progress toward completion of degree requirements are subject to dismissal from the program (see the UC Santa Cruz Graduate Handbook and the AM Graduate Handbook for the policy on satisfactory academic progress). Also, please refer to specific guidelines on the annual student reviews.

Foreign Language Requirements

Applying for Graduation

All candidates for a degree must submit an application for the M.S. degree to the Graduate Student Affairs Office by the date stated in the Academic and Administrative Calendar for the quarter they wish to receive the degree. The deadline for degree applications is typically in the second week of the quarter. A student is required to be registered or on filing fee during the quarter in which the

degree is conferred. For more information about applying for graduation, visit the Baskin School of Engineering Graduate Studies website.

SCIENTIFIC COMPUTING DESIGNATED EMPHASIS

Introduction

Students from another degree program who meet certain requirements can have the designated emphasis of “Scientific Computing” annotated to their degree title. For example, an M.S. or Ph.D. student in physics who meets the requirements would get a certification that reads “M.S. in Physics with an emphasis in Scientific Computing” or “Ph.D. in Physics with an emphasis in Scientific Computing”.

Requirements

Committee Composition and Departmental Approvals

Upon electing to pursue a designated emphasis (DE) in scientific computing, students must choose a DE faculty adviser in the Department of Applied Mathematics. A list of eligible DE advisers is maintained online. The student must organize a preliminary meeting with the DE adviser, and agree on a plan for completion of the requirements. Once this plan has been designed, the student and the adviser must complete the DE application form available online. The completed application form should then be signed by the Applied Mathematics graduate director and filed in the Baskin School of Engineering Graduate Student Affairs Office. This should ideally be done before the student’s advancement to candidacy (for Ph.D. students), and no later than three months before the planned date for the oral presentation completion requirement.

Course Requirements

Students declaring a designated emphasis in Scientific Computing must complete the courses listed below.

All of the following courses:

AM 213A	Numerical Linear Algebra	5
AM 213B	Numerical Methods for the Solution of Differential Equations	5
AM 250	An Introduction to High Performance Computing	5

Plus one of the following approved elective courses:

AM 230	Numerical Optimization	5
AM 260	Computational Fluid Dynamics	5
CSE 201	Analysis of Algorithms	5
CSE 242	Machine Learning	5

Students can add a different elective course to the list by submitting a petition to the AM graduate director.

Writing, Research and/or Teaching Requirements

- **Writing requirements:** a substantial and original written body of work related to scientific computing, associated with substantial code development or substantial modification of existing code, or development of significant computational tools for data analysis. The write-up could take the form of a paper (at least submitted), or an M.S., M.A., or Ph.D. thesis chapter, for instance.
- **Oral presentation requirement:** a presentation of no less than 30 minutes during which the student must demonstrate mastery of the scientific computing component of the submitted written piece of work. This presentation could be the student’s qualifying exam, or the Ph.D. defense, or a separate presentation. The DE adviser must be invited to attend this presentation.

Review of Progress

Applying for Graduation

All candidates for a degree must submit an application for the master's degree or an application for the doctorate in philosophy degree to the appropriate office in their primary department by the date stated in the Academic and Administrative Calendar for the quarter they wish to receive the degree. Students who have completed a designated emphasis should be sure to note the designated emphasis on the degree application. The deadline for degree applications is typically in the second week of the quarter. A student is required to be registered or on filing fee during the quarter in which the degree is conferred.

Biomolecular Engineering

Baskin School of Engineering
335 Baskin Engineering Building
(831) 459-2158
<https://www.soe.ucsc.edu/departments/biomolecular-engineering>

PROGRAMS OFFERED

Biomolecular Engineering and Bioinformatics B.S. (p. 431)

Biotechnology B.A. (p. 440)

Bioinformatics Minor (p. 444)

Contiguous Bachelor's/Master's Pathway (p. 444)

Biomolecular Engineering and Bioinformatics M.S. (p. 445)

Biomolecular Engineering and Bioinformatics Ph.D. (p. 446)

The Department of Biomolecular Engineering (BME) is an interdisciplinary department that combines expertise from biology, mathematics, chemistry, computer science, and engineering to train students and develop technologies to address major problems at the forefront of biomedical and bio-industrial research. Students trained in the Department of Biomolecular Engineering can look forward to careers in academia, the information and biotechnology industries, public health, or medical sciences.

The department offers a bachelor of science (B.S.) degree in biomolecular engineering and bioinformatics, a minor in bioinformatics, and graduate master of science (M.S.) and doctor of philosophy (Ph.D.) degrees in biomolecular engineering and bioinformatics. The department co-sponsors the Program in Biomedical Science and Engineering (PBSE), a doctoral training program, with the departments of MCD Biology, Chemistry and Biochemistry, and Microbiology and Environmental Toxicology.

Departmental faculty advise undergraduate and graduate researchers enrolled in the bioinformatics, bioengineering, and related degree programs. Members of the Department of Biomolecular Engineering actively collaborate with faculty from other Baskin School of Engineering departments, such as Applied Mathematics and Statistics, Computer Engineering, Computer Science, and Electrical Engineering; and with the Physical and Biological Sciences departments of MCD Biology, Chemistry and Biochemistry, Microbiology and Environmental Toxicology, Ecology and Evolutionary Biology, and Ocean Sciences.

UNDERGRADUATE PROGRAM

Courses for Nonmajors

BME 5, Introduction to Biotechnology, presents a broad overview of the impact of biotechnology on the diagnosis and treatment of disease.

BME 18, Scientific Principles of Life, covers the principles of life as it exists on this planet and how they generalize. Discusses Darwinian evolution, genomes, scientific theories of life (mechanistic, thermodynamic, information theoretic), and future of life (Internet, machine learning and adaptation, artificial intelligence, genome editing, fully artificial life).

BME 80G, Bioethics in the Twenty-First Century: Science, Business, and Society, is particularly appropriate to all students interested in the societal issues surrounding the revolutions in bioinformatics and biotechnology.

BME 80H, The Human Genome, covers principles of human inheritance and techniques used in gene analysis and discusses the evolutionary, social, ethical, and legal issues associated with knowledge of the human genome.

BME 110, Computational Biology Tools, provides an introduction to the tools and techniques of bioinformatics from a user's view. It is intended for biologists and

biochemists who need to use bioinformatics tools, but are not primarily interested in building new bioinformatics tools.

BME 130, Genomes, teaches the principles of genome-scale analysis to answer biological questions.

BME 160, Programming for Biologists and Biochemists, provides an introductory programming class using Python to analyze, transform, and publish biological data.

BME 163, Applied Visualization and Analysis of Scientific Data, extends this life-science data focus with an emphasis on understanding and presenting that data.

GRADUATE PROGRAM

The Department of Biomolecular Engineering offers interdisciplinary M.S. and Ph.D. degrees in biomolecular engineering and bioinformatics and accepts students from a wide-variety of backgrounds. A typical cohort includes incoming students from molecular biology, genetics, computer science, engineering, and mathematics. The unifying theme of our research training program is using quantitative approaches to addressing fundamental questions in biology and biomedical science. The Ph.D. program prepares students to lead independent research programs in academic or industry settings. The M.S. program is designed to prepare students for careers in contemporary biomedical research settings in the biotechnology industry.

Program coursework is designed to provide the technical skills in programming and other technical skills required for independent and advanced scientific discovery. Incoming students undertake rigorous core coursework, conduct laboratory rotations (Ph.D. only), and are exposed to a rich environment of regular seminars and group meetings. Students interact closely with biomolecular engineering and bioinformatics faculty members while undertaking their dissertation research (Ph.D.) or capstone projects (M.S.), and have first-hand access to state-of-the-art computation tools and laboratory facilities throughout their training, including cluster computing and high-throughput sequencing facilities.

BIOMOLECULAR ENGINEERING AND BIOINFORMATICS B.S.

Information and Policies

Introduction

The biomolecular engineering and bioinformatics major includes the biomolecular engineering (BME) and bioinformatics (BINF) concentrations. The BME concentration is designed for students interested in protein engineering, stem cell engineering, and synthetic biology. The emphasis is on designing biomolecules (DNA, RNA, proteins) and cells for particular functions,

and the underlying sciences are biochemistry and cell biology.

The BINF concentration combines mathematics, science, and engineering to explore and understand biological data from high-throughput experiments, such as genome sequencing, gene-expression chips, and proteomics experiments. The program builds upon the research and academic strengths of the faculty in the Biomolecular Engineering Department.

In both concentrations, students participate in a capstone experience. Options for the senior capstone experience include

- **Senior Design**—a three-quarter group project intended to prepare students for work in industry,
- a summer full-time synthetic biology project based on the **iGEM** competition,
- A three-quarter **Senior thesis**,
- or an **Advanced bioinformatics** course series. The last option is the required capstone for students participating in the bioinformatics concentrations.

All capstone options involve working closely with faculty and other researchers at UCSC, analyzing ideas, developing technologies, and discovering new approaches. Application areas include biomolecular sensors and systems, nano-electronic implants, assistive technologies for the elderly and disabled, bioinformatics, microfluidics, nanoscale biotechnology, environmental monitoring, and other areas at the junction between engineering and the life sciences.

More information about bioengineering research and undergraduate research opportunities can be found at Undergraduate Research Opportunities, the Genomics Institute, the Program in Biomedical Sciences and Engineering, the STEM Maximizing Access to Research Careers (MARC) program, and the STEM diversity programs.

The program has course requirements in mathematics, science, and engineering. Students interested in Biomolecular Engineering and Bioinformatics as a major should contact the School of Engineering advising office (bsoadvising@ucsc.edu) before enrolling in any courses at UCSC. Early advising is particularly important before choosing calculus and physics courses.

Biomolecular engineering and bioinformatics students may continue their research and studies at UCSC in any of several graduate programs. Information may be found at the Division of Graduate Studies website.

The immense growth of biological information stored in computerized databases has led to a critical need for people who can understand the languages, tools, and techniques of statistics, science, and engineering. A classically trained scientist may be unfamiliar with the statistical and algorithmic knowledge required in this

field. A classically trained engineer may be unfamiliar with the chemistry and biology required in the field. Thus, this major strives for a balance of the two: an engineer focused on the problems of the underlying science or, conversely, a scientist focused on the use of engineering tools for analysis and discovery.

Academic Advising for the Program

The Baskin School of Engineering Undergraduate Advising office offers general advising for prospective and declared undergraduates majoring in School of Engineering programs. The office handles major declarations, transfer credits, course substitutions, articulations, and degree certifications. Undergraduate students obtain and submit all paperwork requiring departmental approval to the undergraduate advising office. Transfer students should also refer to the Transfer Information and Policy section.

Baskin Engineering Building, Room 225
bsoadvising@ucsc.edu
 (831) 459-5840

Getting Started in the Major

Students applying for admission as first-year students proposing to take the biomolecular engineering and bioinformatics major should have completed four years of high school mathematics (through advanced algebra and trigonometry) and three years of science, including one year of chemistry and one year of biology. Comparable college mathematics and science courses completed at other institutions may be accepted in place of high school preparation. Students without this preparation may be required to take additional courses to prepare themselves for the program.

Program Learning Outcomes

A biomolecular engineering and bioinformatics student completing the program should:

- have a broad knowledge of science and engineering disciplines including biology, chemistry, mathematics, statistics, and computer science; those completing the BINF concentration will also have a detailed knowledge of mathematics, statistics, and computer science; and, those completing the BME concentration will have broader knowledge in biology and chemistry;
- be able to apply their knowledge to identify, formulate, and solve engineering design problems;
- be able to write programs in Python;
- be able to find and use information from a variety of sources, including books, journal articles, online encyclopedias, and manufacturer data sheets;
- be able to design and conduct experiments, as well as to analyze and interpret data;

- be able to work effectively with partners and on teams;
- be able to communicate problems, experiments, and design solutions in writing, orally, and as posters; and
- be able to apply ethical reasoning to make decisions about engineering methods and solutions in a global, economic, environmental, and societal context.

Major Qualification Policy and Declaration Process

Major Qualification

In order to be admitted into the biomolecular engineering and bioinformatics major students must be listed as a proposed major within the School of Engineering. Please refer to the School of Engineering's "Proposed Major Retention" and its "Declaring a School of Engineering Major" sections in the catalog and the Undergraduate Affairs website for more information.

In addition to being listed as a proposed School of Engineering major, students must have completed at least 45 credits with a GPA of 2.8 or better in courses required for the major. Students with more than 7 credits of grades of NP, C-, D+, D, D-, or F in these courses are not qualified for the major.

Students wishing to declare the biomolecular engineering and bioinformatics major after the sixth quarter must appeal, must already have a declared major in which they have completed at least one major requirement course and be making reasonable progress, and must have completed 10 more credits of required courses in the biomolecular engineering and bioinformatics major for each additional quarter.

Transfer students should refer to the Transfer Information and Policy section.

Appeal Process

Students who are informed that they are not eligible to declare may appeal this decision by submitting a letter to the undergraduate director within 15 days from the date the notification was mailed. Within 15 days of receipt of the appeal, the Undergraduate Advising office will notify the student, the college, and the Office of the Registrar of the decision.

If you have further questions concerning the appeal process, please contact the Undergraduate Advising office at (831) 459-5840 or email bsoe advising@ucsc.edu.

More information is available regarding the appeal process.

How to Declare a Major

Instructions for declaring a major in the Baskin School of Engineering are on the division's website here.

Transfer Information and Policy

Transfer Admission Screening Policy

Transfer students need to complete the equivalents of eight courses from the following list with a GPA in those courses of 2.8 or better:

BME 80G	Bioethics in the 21st Century: Science, Business, and Society	5
CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1C	General Chemistry	5
CHEM 8A	Organic Chemistry	5
CHEM 8B	Organic Chemistry	5
BIOL 20A	Cell and Molecular Biology	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
AM 10	Mathematical Methods for Engineers I	5

Transferring to Biomolecular Engineering

Students transferring into the biomolecular engineering concentration may also count any of the following:

PHYS 5A	Introduction to Physics I	5
PHYS 5B	Introduction to Physics II	5
BME 21L	Introduction to Basic Laboratory Techniques	3
AM 20	Mathematical Methods for Engineers II	5

Transferring to Bioinformatics

Students transferring into the bioinformatics concentration may also count any of the following:

CSE 16	Applied Discrete Mathematics	5
CSE 13S	Computer Systems and C Programming	7
CSE 30	Programming Abstractions: Python	7

Transfer students may use courses articulated to PHIL 22, PHIL 24, or PHIL 28 in place of BME 80G, if these courses are taken prior to registering at UC Santa Cruz.

Getting Started at UCSC as a Transfer Student

Transfer students should declare their major in their first quarter at UCSC. Instructions for declaring a major in the Baskin School of Engineering are at <https://undergrad.soe.ucsc.edu/declare-your-major>.

Letter Grade Policy

The Baskin School of Engineering requires letter grades for all courses in an engineering major.

[Optional Catchall]

Course Substitution Policy

Please refer to the Undergraduate Affairs course substitution website for Baskin School of Engineering policies about taking courses at other institutions after enrolling at UCSC.

Double Majors and Major/Minor Combinations Policy

Double majors with other biology-related majors are permitted for the bioinformatics concentration, but not for the biomolecular engineering concentration.

The BMEB major cannot be combined with a bioinformatics minor.

Study Abroad

Students are encouraged to investigate studying for short periods of time (a summer or a quarter) at other institutions, to broaden their education.

The BME Department has established an exchange program with Danish Technical University (DTU), which makes study there for one semester relatively easy, particularly for the bioinformatics concentration. Proposed plans of study should still be cleared with the undergraduate director.

Other exchange programs are also being developed.

Honors

Biomolecular engineering and bioinformatics majors are considered for "Honors in the Major" and "Highest Honors in the Major" based on their GPA and on results of undergraduate research. Students with a GPA of 3.7 or higher receive "Highest Honors in the Major." Students with a GPA of 3.3 or higher, but lower than 3.7, receive "Honors in the Major." Students with particularly significant accomplishments in undergraduate research may receive honors or highest honors with a lower GPA. Students who have been found guilty of academic misconduct are not eligible for either honors or highest honors.

Because of the enormous breadth of requirements, biomolecular engineering and bioinformatics majors are urged to take honors courses or sections whenever possible to get as much as possible out of the courses they take in each field.

[Optional Catchall]

Biomolecular Engineering Concentration

The biomolecular engineering concentration focuses on wet-lab work, but with a modern appreciation for the

statistics and computational tools needed for high-throughput experimentation.

Course Requirements

Biomolecular engineering concentration majors must complete the following courses:

Lower-Division Courses

Biology

All of the following courses:

BIOL 20A	Cell and Molecular Biology	5
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Biology laboratory course

Either of the following courses:

BIOL 20L	Experimental Biology Laboratory	2
BME 21L	Introduction to Basic Laboratory Techniques	3

BME 21L is strongly preferred.

Bioethics

BME 80G	Bioethics in the 21st Century: Science, Business, and Society	5
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Chemistry

All of the following courses:

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1M	General Chemistry Laboratory	2
CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2
CHEM 8A	Organic Chemistry	5
CHEM 8B	Organic Chemistry	5

Laboratory courses

One of the following options:

Either these courses		
BME 22L	Foundations of Design and Experimentation in Molecular Biology, Part I	2
BME 23L	Foundations of Design and Experimentation in Molecular Biology, Part II	2
or these courses		
CHEM 8L	Organic Chemistry Laboratory	2
CHEM 8M	Organic Chemistry Laboratory	2

BME 22L and BME 23L are strongly preferred.

Mathematics

Choose one of the following options:

Either these courses

MATH 20A	Honors Calculus	5
MATH 20B	Honors Calculus	5

or these courses

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

MATH 19A and MATH 19B are the recommended sequence. Credit for one or both can be granted with adequate performance on the College Entrance Examination Board (CEEB) calculus AB or BC Advanced Placement examination.

Applied Math

Both of these applied math courses:

AM 10	Mathematical Methods for Engineers I	5
AM 20	Mathematical Methods for Engineers II	5

Students may substitute MATH 21 for AM 10, and MATH 24 for AM 20, if they can show MATLAB proficiency at the level of students in the AM class that they are replacing.

Physics

All of the following courses:

PHYS 5A	Introduction to Physics I	5
PHYS 5L	Introduction to Physics I Laboratory	1
PHYS 5B	Introduction to Physics II	5
PHYS 5M	Introduction to Physics II Laboratory	1

Upper-Division Courses**Statistics**

Two statistics courses:

STAT 131	Introduction to Probability Theory	5
	AND	

Either one of these courses

STAT 132	Classical and Bayesian Inference	5
STAT 206	Applied Bayesian Statistics	5

Biochemistry and Molecular Biology

All of the following courses:

BIOC 100A	Biochemistry and Molecular Biology	5
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BIOC 100B	Biochemistry and Molecular Biology	5
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Biomolecular Engineering

Choose one of the following courses:

BME 105	Genetics in the Genomics Era	5
BIOL 105	Genetics	5

BME 105 is strongly recommended.

Plus all of the following courses:

BME 110	Computational Biology Tools	5
BME 160	Research Programming in the Life Sciences	6
BME 163	Applied Visualization and Analysis of Scientific Data	3

Plus one of the following Modeling/Design sequences:

Either these courses

BME 128	Protein Engineering	5
BME 128L	Protein Engineering Laboratory	2

or these courses

BME 177	Engineering Stem Cells	5
BME 128L	Protein Engineering Laboratory	2

or these courses

AM 115	Stochastic Modeling in Biology	5
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Technical Writing (one of the following courses)

BME 185	Technical Writing for Biomolecular Engineers	5
CSE 185E/CSE 101	Technical Writing for Computer Science and Engineering	5

BME 185 is recommended, as CSE 185E has additional prerequisites.

Elective

One of the following (the course taken to satisfy this elective cannot be used to satisfy other requirements of the major):

AM 147	Computational Methods and Applications	5
METX 119	Microbiology	5
METX 140	Molecular Biology and Microbial Genetics	5
BIOC 100C	Biochemistry and Molecular Biology	5
BIOL 115	Eukaryotic Molecular Biology	5
BME 122H	Extreme Environmental Virology	5
BME 128	Protein Engineering	5

BME 128L	Protein Engineering Laboratory	2	or these courses		
BME 130	Genomes	5	BME 180	Professional Practice in Bioengineering	2
BME 132	Evolutionary Genomics	5	BME 188A	Synthetic Biology--Mentored Research A	2
BME 140	Bioinstrumentation	5	BME 188B	Synthetic Biology--Mentored Research B	5
BME 175	Entrepreneurship in Biotechnology	5	BME 188C	Synthetic Biology Mentored Research C	5
BME 177	Engineering Stem Cells	5	or these courses		
BME 178	Stem Cell Biology	5	BME 205	Bioinformatics Models and Algorithms	5
ECE 104	Bioelectronics	5	BME 230A	Introduction to Computational Genomics and Systems Biology	5
	or any 5-credit biomolecular engineering graduate course		or these courses		

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. Biomolecular engineering and bioinformatics majors satisfy the DC requirement by completing one of the following courses:

BME 185	Technical Writing for Biomolecular Engineers	5	BME 193	Field Study	5
CSE 185E/CSE 101	Technical Writing for Computer Science and Engineering	5	BME 123T	Senior Thesis Writing	5

BME 185 is recommended, as CSE 185E has additional prerequisites.

Comprehensive Requirement

All biomolecular engineering concentration students must complete a senior capstone project as a group project, as a series of Advanced Bioinformatics courses, or as an individual senior thesis doing research in a faculty laboratory.

Note that the Technical Writing requirement is a prerequisite for all the capstone options, including the senior thesis. Students pursuing the senior thesis option must write a two-page thesis proposal and seek approval of their project from the undergraduate director in the quarter preceding the independent study courses, typically spring quarter of the third year. Students are responsible for ensuring that they meet the prerequisites for whichever capstone they choose.

To complete the senior capstone requirement, Biomolecular Engineering concentrations students must complete one of the following:

Either these courses		
BME 129A	Project Design and Implementation in Biomolecular Engineering I	5
BME 129B	Project Design and Implementation in Biomolecular Engineering II	5
BME 129C	Project Design and Implementation in Biomolecular Engineering III	5

BME 198	Individual Study or Research	5
BME 123T	Senior Thesis Writing	5

Exit Requirements

Students are required to submit a portfolio, exit survey, and attend an exit interview.

The portfolios must be turned in electronically as PDF files by the last day of the quarter of graduation, and will be reviewed quarterly by the undergraduate director.

Portfolios must contain the following:

- A substantial written report on a modeling/design project. This is typically satisfied by a senior thesis, or a written capstone project report.
- Slides from a substantial verbal presentation. This is typically satisfied by a capstone design presentation, Stem Cell Engineering, or other design courses.
- A research poster. This is typically satisfied by a senior thesis poster or a capstone design project poster, presented at the undergraduate poster symposium.

The three parts of the portfolio should represent at least two different design projects. If a senior thesis is completed, it must be provided as the written report. If a capstone project is completed, it must be provided as one (or more) of the three submissions.

Exit interviews are scheduled during the last week of the quarter by the Baskin School of Engineering (BSOE) advising office, generally as small group interviews.

Planners

Every biomolecular engineering and bioinformatics major must have a faculty advisor, assigned by the Baskin School of Engineering undergraduate advising office, and with that advisor must formulate a program of proposed coursework that meets the major requirements. The choice of capstone and electives should be made early, so that the plan can be tailored to fit in the chosen courses.

As in all engineering and science programs, it is recommended that students spread their general education requirements out over all 12 quarters. Delaying a general education requirement is safer than delaying a major requirement.

It is recommended that students reserve the summer after the junior year for undergraduate research.

Curriculum charts for the major are available on the BSOE website.

Sample Plan: Biomolecular Engineering Concentration

Year	Fall	Winter	Spring
1st (frosh)	CHEM 1A	MATH 19B	AM 10
	MATH 19A	CHEM 1B & CHEM 1M	CHEM 1C & CHEM 1N BME 21L
2nd (soph)	BME 22L	BME 23L	BME 105
	CHEM 8A	CHEM 8B	PHYS 5B & PHYS 5M
	BIOL 20A	PHYS 5A & PHYS 5L AM 20	
3rd (junior)	BIOC 100A	BIOC 100B	AM 115
	BME 110	BME 160	BME 163
	BME 185	STAT 131	
4th (senior)	BME 129A	BME 129B	BME 129C
	BME 80G	STAT 132	Elective

Students who can take Organic Chemistry (CHEM 8A and CHEM 8B, or transferable equivalents) in summer after their first year can take BIOC 100A in their second year and be ready to join a research lab a year earlier.

Here is an alternative plan for students who do organic chemistry in summer.

Sample Plan: Biomolecular Engineering Concentration (CHEM 8A & CHEM 8B In summer after first year)

Year	Fall	Winter	Spring
1st (frosh)	CHEM 1A	MATH 19B	BIOL 20A
	MATH 19A	CHEM 1B & CHEM 1M	CHEM 1C & CHEM 1N BME 21L
2nd (soph)	BME 22L	BME 23L	BME 105
	BIOC 100A	BIOC 100B	PHYS 5B & PHYS 5M
3rd (junior)	BME 80G	PHYS 5A & PHYS 5L	
	BME 185	AM 20	
	BME 110	BME 160	BME 163
4th (senior)	BME 129A	BME 129B	BME 129C
	STAT 131	STAT 132	Elective
			AM 115

General education requirements:

CC, ER, and IM are not met by any courses in the program.

MF, SI, SR and PE are met by required courses.

TA can be met by several electives: BME 122H, BME 132, BME 177, or BME 178.

PR-E can be met by some capstone options: BME 129C or BME 180.

C is not met by courses in the program, but is a prerequisite for the required BME 185 or CSE 185E course.

Transfer planner

Year	Fall	Winter	Spring
1st (junior)	BIOC 100A	BIOC 100B	BME 105
	BME 80G	BME 110	BME 160

	BME 185	AM 20	PHYS 5B & PHYS 5M
	BME 22L	BME 23L	
2nd(senior)	BME 129A	BME 129B	BME 129C
	STAT 131	STAT 132	BME 163
	Elective		AM 115

This transfer planner assumes that a student has completed the equivalent of CHEM 1A, CHEM 1B, CHEM 1M, CHEM 1C, CHEM 1N, CHEM 8A, CHEM 8B, MATH 19A, MATH 19B, PHYS 5A, PHYS 5L, BIOL 20A, AM 10, a molecular biology lab, and all general education courses before coming to UC Santa Cruz. Students are also expected to have completed all the general education requirements, except those covered by the required courses. This planner is only a proof-of-concept that the major can be completed in another two years; each student will need to work with an advisor to tailor their own schedule.

Bioinformatics Concentration

The bioinformatics concentration focuses on dry-lab (computational) techniques.

Bioinformatics concentration majors must complete the following courses:

Course Requirements

Lower-Division Courses

Biology

BIOL 20A	Cell and Molecular Biology	5
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Biomolecular Engineering

BME 80G	Bioethics in the 21st Century: Science, Business, and Society	5
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Chemistry

All of the following courses:

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1M	General Chemistry Laboratory	2
CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2
CHEM 8A	Organic Chemistry	5
CHEM 8B	Organic Chemistry	5

Computer Science and Engineering

All the following courses:

CSE 13S	Computer Systems and C Programming	7
CSE 16	Applied Discrete Mathematics	5
CSE 30	Programming Abstractions: Python	7
CSE 101	Introduction to Data Structures and Algorithms	5

BME 160 is prerequisite to both CSE 13S and CSE 30.

Mathematics

Choose one of the following options:

Either these courses		
MATH 20A	Honors Calculus	5
MATH 20B	Honors Calculus	5
AM 10	Mathematical Methods for Engineers I	5
or these courses		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
AM 10	Mathematical Methods for Engineers I	5

MATH 19A and MATH 19B are the recommended sequence. Credit for one or both can be granted with adequate performance on the College Entrance Examination Board (CEEB) calculus AB or BC Advanced Placement examination.

Students may substitute MATH 21 for AM 10, if they can show MATLAB proficiency at the level of students in the AM class.

Upper-Division Courses

Statistics

Two statistics courses:		
STAT 131	Introduction to Probability Theory AND	5
Either one of these courses		
STAT 132	Classical and Bayesian Inference	5
STAT 206	Applied Bayesian Statistics	5

Biochemistry and Molecular Biology

BIOC 100A	Biochemistry and Molecular Biology	5
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Biomolecular Engineering**Plus one of the following courses:**

BME 105	Genetics in the Genomics Era	5
BIOL 105	Genetics	5

BME 105 is strongly recommended.

Plus all of the following courses:

BME 110	Computational Biology Tools	5
BME 160	Research Programming in the Life Sciences	6
BME 163	Applied Visualization and Analysis of Scientific Data	3

Plus one of the following Modeling/Design sequences:

Either these courses

AM 20	Mathematical Methods for Engineers II	5
AM 115	Stochastic Modeling in Biology	5

or these courses

AM 30	Multivariate Calculus for Engineers	5
CSE 142	Machine Learning	5
AM 30	Multivariate Calculus for Engineers	5
CSE 144	Applied Machine Learning	5

Students may substitute MATH 24 for AM 20, and MATH 22 or MATH 23A for AM 30, if they can show MATLAB proficiency at the level of students in the AM class that they are replacing.

Technical Writing

Choose one of the following courses:

BME 185	Technical Writing for Biomolecular Engineers	5
CSE 185E/CSE 101	Technical Writing for Computer Science and Engineering	5

CSE 185E is recommended, as it has more focus on writing about computer programming and includes some LaTeX instruction.

Elective

One of the following (courses satisfying an elective cannot be used to satisfy other requirements of the major):

AM 147	Computational Methods and Applications	5
BME 122H	Extreme Environmental Virology	5
BME 128	Protein Engineering	5

BME 128L	Protein Engineering Laboratory	2
BME 130	Genomes	5
BME 132	Evolutionary Genomics	5
BME 140	Bioinstrumentation	5
BME 175	Entrepreneurship in Biotechnology	5
BME 177	Engineering Stem Cells	5
BME 178	Stem Cell Biology	5
BIOC 100B	Biochemistry and Molecular Biology	5
CSE 142	Machine Learning	5
CSE 144	Applied Machine Learning	5
METX 119	Microbiology	5
METX 140	Molecular Biology of Prokaryotes	5

or any 5-credit biomolecular engineering graduate course

Database management

The following course is required:

CSE 182	Introduction to Database Management Systems	5
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CSE 180 may be substituted for CSE 182, but BMEB students do not have registration priority.

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. Biomolecular engineering and bioinformatics majors satisfy the DC requirement by completing one of the following courses:

BME 185	Technical Writing for Biomolecular Engineers	5
CSE 185E/CSE 101	Technical Writing for Computer Science and Engineering	5

Comprehensive Requirement

The senior capstone is fulfilled by completing all of the following courses:

BME 205	Bioinformatics Models and Algorithms	5
BME 230A	Introduction to Computational Genomics and Systems Biology	5

Exit Requirements

Students are required to submit a portfolio, exit survey, and attend an exit interview.

The portfolios must be turned in electronically as PDF files by the last day of the quarter of graduation, and will be reviewed quarterly by the undergraduate director.

Portfolios must contain the following:

- A substantial written report on a modeling/design project. This is typically satisfied by a senior thesis, or a written capstone project report.

- Slides from a substantial verbal presentation. This is typically satisfied by a capstone design presentation, Stem Cell Engineering, or other design courses.
- A research poster. This is typically satisfied by a senior thesis poster or a capstone design project poster, presented at the undergraduate poster symposium.

The three parts of the portfolio should represent at least two different design projects. If a senior thesis is completed, it must be provided as the written report. If a capstone project is completed, it must be provided as one (or more) of the three submissions.

Exit interviews are scheduled during the last week of the quarter by the Baskin School of Engineering (BSOE) advising office, generally as small group interviews.

Planners

Every biomolecular engineering and bioinformatics major must have a faculty advisor, assigned by the Baskin School of Engineering undergraduate advising office, and with that advisor must formulate a program of proposed coursework that meets the major requirements. The choice of capstone and electives should be made early, so that the plan can be tailored to fit in the chosen courses.

As in all engineering and science programs, it is recommended that students spread their general education requirements out over all 12 quarters. Delaying a general education requirement is safer than delaying a major requirement.

It is recommended that students reserve the summer after the junior year for undergraduate research.

Curriculum charts for the major are available on the BSOE website.

Sample Plan: Bioinformatics Concentration

Year	Fall	Winter	Spring
1st (frosh)	CHEM 1A	CHEM 1B & CHEM 1M	BIOL 20A
	MATH 19A	MATH 19B	CHEM 1C & CHEM 1N
2nd (soph)	CHEM 8A	CHEM 8B	BME 105
	AM 10	CSE 16	BME 160
	BME 80G		AM 30
3rd (junior)	BIOC 100A	CSE 13S	BME 163
	STAT	STAT 132	CSE 101

	131		
	CSE 30		CSE 182
4th (senior)	BME 205	BME 230A	Elective
	BME 110	CSE 185E	CSE 144

General education requirements:

CC, ER, IM, and PR-E are not met by any courses in the program.

MF, PE-T, SI, and SR are met by required courses.

TA can be met by several electives: BME 122H, BME 132, BME 177, or BME 178.

C is not met by courses in the program, but is a prerequisite for the required BME 185 or CSE 185E course.

Transfer planner

Year	Fall	Winter	Spring
3rd (junior)	BIOC 100A	BME 110	BME 105
	AM 10	BME 160	BME 163
	STAT 131	STAT 132	CSE 30
4th (senior)	BME 205	BME 230A	Elective
	BME 80G	CSE 185E	CSE 182
	CSE 101	CSE 144	AM 30

This transfer planner assumes that a student has completed the equivalent of CHEM 1A, CHEM 1B, CHEM 1M, CHEM 1C, CHEM 1N, CHEM 8A, CHEM 8B, MATH 19A, MATH 19B, BIOL 20A, CSE 16, and CSE 13S and all general education requirements, except those covered by the required courses. This planner is only a proof-of-concept that the major can be completed in another two years; each student will need to work with an advisor to tailor their own schedule.

BIOTECHNOLOGY B.A.

Information and Policies

Introduction

The Bachelor of Arts in Biotechnology is intended for students who plan to be involved in the biotechnology industry as writers, artists, ethicists, executives, sales force, regulators, lawyers, politicians, and other roles that require an understanding of the technology, but not the intensive training needed for technicians, research scientists, engineers, and bioinformaticians. (For those

more technical roles, the biomolecular engineering and bioinformatics major or the molecular, cell, and developmental biology major is recommended.)

The major is deliberately designed to be suitable as a double major for students in the humanities or social sciences.

Academic Advising for the Program

The Baskin School of Engineering (BSOE) Undergraduate Advising office offers general advising for prospective and declared undergraduates majoring in School of Engineering programs. The office handles major declarations, transfer credits, course substitutions, articulations, and degree certifications. Undergraduate students obtain and submit all paperwork requiring departmental approval to the undergraduate advising office. Transfer students should also refer to the Transfer Information and Policy section.

Baskin Engineering Building, Room 225
bsoeadvising@ucsc.edu
(831) 459-5840

Getting Started in the Major

Students applying for admission as first-year students proposing to take biotechnology should have completed high-school biology. Any UC-eligible student with a strong interest in biotechnology is welcome in the program.

Program Learning Outcomes

A biotechnology student completing the program should:

- have familiarity with several different biotechnologies;
- be able to find and use information from a variety of sources, including books, journal articles, and online encyclopedias;
- be able to write programs in Python;
- be able to communicate clearly in writing, orally, and as posters; and
- be able to apply ethical reasoning to make decisions about biotechnology in a global, economic, environmental, and societal context.

Major Qualification Policy and Declaration Process

Major Qualification

Transfer students should refer to the Transfer Information and Policy section.

To qualify for the biotechnology major, students must have completed four of the following lower-division courses:

CH	General Chemistry	5
EM		
1A		
BIO	Cell and Molecular Biology	5
L		
20A		
BM	Introduction to Biotechnology	5
E 5		
BM	Scientific Principles of Life	5
E		
18		
BM	Bioethics in the 21st Century: Science, Business, and Society	5
E		
80G		
BM	The Human Genome	5
E		
80H		
CS	Beginning Programming in Python	5
E		
20		
EC	Engineering Innovations for Medicine and Natural Sciences	5
E		
80B		
ST	Statistics	5
AT		
5		
ST	Statistical Methods for the Biological, Environmental, and Health Sciences	5
AT		
7		
ST	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2
AT		
7L		

Can only take either STAT 5 and STAT 7. STAT 7 and STAT 7L must be taken together and count as one course.

Appeal Process

Students who are informed that they are not eligible to declare may appeal this decision by submitting a letter to the BSOE Undergraduate Advising Office. Within 15 days of receipt of the appeal, the Undergraduate Advising office will notify the student, the college, and the Office of the Registrar of the decision.

If you have further questions concerning the appeal process, please contact the Undergraduate Advising office at (831) 459-5840 or email bsoeadvising@ucsc.edu.

More information regarding the appeal process can be found on the BSOE Undergraduate Affairs website.

How to Declare a Major

Instructions for declaring a major in the Baskin School of Engineering are on the BSOE Undergraduate Affairs website.

Students should submit a petition to declare as soon as they complete the major qualification requirements or reach their declaration deadline quarter (whichever comes first).

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed major qualification courses.

Transfer Information and Policy

Transfer Admission Screening Policy

Transfer students need to have completed the following three courses:

Both these courses

BIOL 20A	Cell and Molecular Biology	5
CSE 20	Beginning Programming in Python	5

And

Either this course

STAT 5	Statistics	5
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Or these courses

STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

CHEM 1A is waived for students transferring in credit for BIOL 20A.

Getting Started at UCSC as a Transfer Student

Transfer students should declare their major in their first quarter at UCSC. Instructions for declaring a major in the Baskin School of Engineering are the BSOE Undergraduate Affairs website.

Letter Grade Policy

The Baskin School of Engineering requires letter grades for all courses in a major.

[Optional Catchall]

Course Substitution Policy

Please refer to the Undergraduate Affairs course substitution website for Baskin School of Engineering policies about taking courses at other institutions after enrolling at UCSC.

Double Majors and Major/Minor Combinations

Policy

Double majoring with humanities or social science majors is encouraged. Double majoring with other biology-related majors is permitted, except for the Biomolecular Engineering and Bioinformatics major, which has too high an overlap in courses.

Honors

Students with a GPA of 3.3 or higher in the major courses will receive Honors in the Major, unless they have been found guilty of academic misconduct.

[Optional Catchall]

Requirements and Planners

Course Requirements

Lower-Division Courses

CHEM 1A	General Chemistry	5
BIOL 20A	Cell and Molecular Biology	5
BME 5	Introduction to Biotechnology	5
CSE 20	Beginning Programming in Python	5

CSE 20 is waived for students who have already passed BME 160.

Statistics: either both of these courses

STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

or this course

STAT 5	Statistics	5
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STAT 7 and STAT 7L is strongly preferred.

Students may substitute STAT 132 for STAT 7 and STAT 7L, but it has several prerequisites that are not required for the major.

Biotechnology and Society

Either

BME 18	Scientific Principles of Life	5
	OR	
BME 80G	Bioethics in the 21st Century: Science, Business, and Society	5

And

B	The Human Genome	5
M		
E		

80		
H		
	OR	
EC	Engineering Innovations for Medicine and	5
E	Natural Sciences	
80		
B		

Upper-Division Courses

BME 105	Genetics in the Genomics Era	5
BME 110	Computational Biology Tools	5
BME 160	Research Programming in the Life Sciences	6

Electives

Three of the following courses, at least two of which are from the Biomolecular Engineering Department:

BME 122H	Extreme Environmental Virology	5
BME 128	Protein Engineering	5
BME 130	Genomes	5
BME 132	Evolutionary Genomics	5
BME 140	Bioinstrumentation	5
BME 177	Engineering Stem Cells	5
BME 178	Stem Cell Biology	5
ECE 104	Bioelectronics	5
FMST 124	Technology, Science, and Race Across the Americas	5
FMST 133	Science and the Body	5
METX 100	Introduction to Microbiology	5
SOCY 121	Sociology of Health and Medicine	5
SOCY 123	Global and Transnational Perspectives in Science and Technology Studies	5
SOCY 127P	Sociology of Drugs, Botanicals and Pharmaceuticals	5

BME 128, BME 177, BME 178, ECE 104, and SOCY 127P all have additional prerequisites not covered by the major requirements.

Disciplinary Communication (DC) Requirement

BME 185	Technical Writing for Biomolecular Engineers	5
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Comprehensive Requirement

The comprehensive requirement is covered by the project in the entrepreneurship course:

BME 175	Entrepreneurship in Biotechnology	5
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Exit Requirements

Students are required to submit a portfolio and exit survey, and they must attend an exit interview.

The portfolios must be turned in electronically as PDF files by the last day of the quarter of graduation, and will be reviewed quarterly by the undergraduate director.

Portfolios must contain the following:

- A substantial written report on a project. This is typically satisfied by the capstone project report.
- Slides from a substantial verbal presentation.
- A poster. This is typically satisfied by a capstone design project poster, presented at the undergraduate poster symposium.

The three parts of the portfolio should represent at least two different projects. At least one of the submissions must be from the capstone course.

Exit interviews are scheduled during the last week of the quarter by the Baskin School of Engineering (BSOE) advising office, generally as small group interviews.

Planners**Sample Plan for Incoming Frosh**

Year	Fall	Winter	Spring
1st (frosh)	BME 18	CHEM 1A BME 80H	BIOL 20A
2nd (soph)	STAT 7 & STAT 7L	BME 5 CSE 20	BME 105
3rd (junior)	BME 130 BME 185	BME 110 METX 100	BME 160
4th (senior)	BME 132*	BME 175	

*These are elective courses. Other elective courses may have prerequisites.

General education requirements:

C is not met by courses in the program, but is a prerequisite for the required BME 185 course.
CC, ER, and IM are not met by any courses in the program.
SR and PE are met by required courses.
SI can be met by BME 18.

TA can be met by several electives: BME 122H, BME 132, BME 177, or BME 178.

Sample Plan for Transfer Students

year	Fall	Winter	Spring
3rd (junior)	BME 130* BME 185	BME 5 BME 160	BME 80H BME 105
4th (senior)	BME 132* BME 140*	BME 175 BME 110	

*These are elective courses. Other elective courses may have prerequisites.

BIOINFORMATICS MINOR

The bioinformatics minor is intended primarily for bioinformatics tool users who are majoring in a biological or chemical specialty. The bioinformatics minor is also appropriate for computer science or computer engineering majors who are considering graduate work in bioinformatics. The bioinformatics minor cannot be combined with the biomolecular engineering and bioinformatics major.

Course Requirements

A bioinformatics minor consists of the following 11 courses:

Lower-Division Courses

Biology

All of the following courses:
BIOL 20A Cell and Molecular Biology 5

Chemistry

The following course:
CHEM 1A General Chemistry 5

Single-Variable Calculus

Choose one of the following options:
Either these courses
MATH 19A Calculus for Science, Engineering, and Mathematics 5
MATH 19B Calculus for Science, Engineering, and Mathematics 5
or these courses
MATH 11A Calculus with Applications 5

MATH 11B Calculus with Applications 5

or these courses
MATH 20A Honors Calculus 5
MATH 20B Honors Calculus 5

MATH 19A, MATH 19B: preferred

Bioethics

Choose one of the following courses:
BME 80G Bioethics in the 21st Century: Science, Business, and Society 5
BME 18 Scientific Principles of Life 5

Upper-Division Courses

Genetics

Choose one of the following courses:
BME 105 Genetics in the Genomics Era 5
BIOL 105 Genetics 5

BME 105: strongly recommended

Programming

All of the following courses:
BME 160 Research Programming in the Life Sciences 6
BME 163 Applied Visualization and Analysis of Scientific Data 3

Statistics

The following courses:
STAT 131 Introduction to Probability Theory AND 5
One of these courses
STAT 132 Classical and Bayesian Inference 5
STAT 206 Applied Bayesian Statistics 5

Bioinformatics

The following course:
BME 110 Computational Biology Tools 5

BIOMOLECULAR ENGINEERING CONTIGUOUS BACHELOR'S/MASTER'S PATHWAY

Because the bioinformatics concentration of the Biomolecular Engineering and Bioinformatics (BME)

B.S. provides excellent preparation for a graduate program in bioinformatics, we offer a contiguous B.S./M.S. degree pathway that allows those students to complete the M.S. somewhat sooner than students with a less-tailored preparation.

The current B.S. and M.S. requirements have three courses in common:

BME 80G, Bioethics in the 21st Century*
 BME 205, Bioinformatics Models and Algorithms*
 BME 230A, Intro to Computational Genomics and Systems Biology*

*These courses must be passed with a grade of B- or better to meet the M.S. requirements.

In accordance with UCSC Graduate Council guidelines for contiguous five-year bachelor's/master's programs, students are required to complete 35 credits during the master's phase of the program. Since BME 205 and BME 230A are taken in the undergraduate phase, the credits cannot be counted toward the overall credits required by the M.S. degree.

Classes should be chosen in consultation with the BME Graduate Advising Committee. Per UCSC Graduate Council policy, up to 15 credits may be upper-division undergraduate courses not already counted toward the B.S. Typically, these courses are selected to address specific interests, cover topics specific for the capstone project, or address specific deficiencies of each student.

Biomolecular engineering graduate courses suitable for fulfilling the 35-credit requirement include, but are not limited to, BME 215, Applied Gene Technology; BME 230B, Advanced Computational Genomics and Systems Biology; BME 232, Evolutionary Genomics. Suitable courses are to be selected in consultation with the Biomolecular Engineering Graduate Advising Committee, the student, and the student's faculty mentor.

The combined B.S./M.S. degree pathway does not make any changes to the undergraduate program nor the graduate program, except that students must pass the overlapping courses listed above for a grade of B- or better.

To apply for the combined pathway, students apply to the M.S. program through the normal graduate admission process in the fall of their senior year. If admitted into the graduate program, they are automatically included in the combined B.S./M.S. pathway.

BIOMOLECULAR ENGINEERING AND BIOINFORMATICS M.S.

Introduction

The unifying theme of our research training program is using quantitative approaches to addressing fundamental questions in biology and biomedical science. The master

of science (M.S.) program is designed to prepare students for careers in contemporary biomedical research settings in the biotechnology industry.

Program coursework is designed to provide the technical skills in programming and other technical skills required for independent and advanced scientific discovery. Incoming students undertake rigorous core coursework and are exposed to a rich environment of regular seminars and group meetings. Students interact closely with biomolecular engineering and bioinformatics faculty members while undertaking capstone projects (M.S.), and have firsthand access to state-of-the-art computation tools and laboratory facilities throughout their training, including cluster computing and high-throughput sequencing facilities.

Requirements

Course Requirements

M.S. students must complete a total of at least 41 credits as described below.

Core courses (5-credit) six are required

The following course:

BME 205	Bioinformatics Models and Algorithms	5
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Plus one of the following courses:

BME 230A	Introduction to Computational Genomics and Systems Biology	5
BME 229	Protein and Cell Engineering	5

Graduate-Level Quantitative Science Course

Students must take one 5-credit graduate-level course focused on quantitative science. Suitable courses are to be selected in consultation with the Biomolecular Engineering Graduate Advising Committee, the student, and the student's faculty mentor.

Ethics Course:

Choose one of the following courses:

BME 80G	Bioethics in the 21st Century: Science, Business, and Society	5
SOCY 268A	Science and Justice: Experiments in Collaboration	5

BME 80G can be taken to meet the ethics requirement, but the credits will not be counted toward the overall credit requirement for the M.S. since it is a lower-division course.

Graduate-Level Biomolecular Engineering Electives

Students must take at least two 5-credit, graduate-level BME courses. Suitable courses are to be selected in

consultation with the Biomolecular Engineering Graduate Advising Committee, the student, and the student's faculty advisor. Alternative electives may be considered with the approval of a student's faculty advisor and the graduate director.

Seminars

A minimum of three seminar courses, including at least one quarter of the 2-credit biomolecular engineering seminar:

BME 280B	Seminar on Bioinformatics and Bioengineering	2
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Research Experience

One quarter of independent study from the following courses:

BME 297A	Independent Study or Research	5
BME 297B	Independent Study or Research	10
BME 297C	Independent Study or Research	15
BME 297F	Independent Study or Research	2

Transfer Limitations

Up to two courses may be transferred from other graduate institutions with the approval of the faculty advisor and the graduate director.

Other Requirements

Bootcamp Activity

Entering graduate cohorts are strongly encouraged to participate in the hands-on "bootcamp" just before the start of the fall quarter. Bootcamp activities include program orientation, laboratory safety training, teaching assistant (TA) training, fellowship advice, cohort building activities, practical advice for navigating graduate school, and a hands-on research project.

Further Study Outside the Department

No further courses are required. However, with faculty guidance students often choose to take upper-division undergraduate courses or graduate courses outside the department to make up for deficiencies in background areas of particular importance.

With consent of the graduate director, variations in the composition of the required courses may be approved.

M.S. Capstone Requirement

This is a Plan II capstone. Students must complete an individual project or a group project with a final written report submitted as part of the final evaluation. That project must be proposed by the student or student-group and be approved by BME faculty. Group projects must include a mechanism for evaluating the contributions of each member of the group.

Adequate Progress

Graduate students receiving two or more U (unsatisfactory) grades or grades below B- in courses relevant to the program are not making adequate progress and will be placed on academic probation for the next three quarters of registered enrollment.

Graduate students who fail (unsatisfactory or lower than B-) a relevant course while on probation may be dismissed from the program. Students may appeal their dismissal. Graduate students who fail a relevant course after being removed from probation are immediately returned to academic probation.

Graduate students experiencing circumstances that may adversely affect their academic performance should consult with their advisor and the graduate director.

Applying for Graduation

All candidates for a degree must submit an Application for Master's Degree to the Graduate Division by the date stated in the Academic and Administrative Calendar for the quarter they wish to receive the degree. The deadline for degree applications is typically in the second week of the quarter. For more information about applying for graduation, visit the Baskin School of Engineering Graduate Studies website.

BIOMOLECULAR ENGINEERING AND BIOINFORMATICS PH.D.

Introduction

Program coursework is designed to provide the technical skills in programming and other technical skills required for independent and advanced scientific discovery. Incoming students undertake rigorous core coursework, conduct laboratory rotations, and are exposed to a rich environment of regular seminars and group meetings. Students interact closely with biomolecular engineering and bioinformatics (BME) faculty members while undertaking their dissertation research, and have firsthand access to state-of-the-art computation tools and laboratory facilities throughout their training, including cluster computing and high-throughput sequencing facilities.

Advancement to Candidacy

Course Requirements

Ph.D. students must complete a total of at least 55 credits as described below.

Core Courses

The following courses:

BME 205	Bioinformatics Models and Algorithms	5
BIOL 200F	Logic and Approaches to Scientific Discovery	5

BME 201	Scientific Writing	3
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BIOL 200F is typically taken as a first-year Ph.D. student, in winter quarter.

BME 201 is typically taken as a second-year Ph.D. student, in winter quarter.

Plus one of the following courses:

BME 230A	Introduction to Computational Genomics and Systems Biology	5
BME 229	Protein and Cell Engineering	5

Graduate-Level Quantitative Science Course

Students must take one 5-credit graduate-level course focused on quantitative science. Suitable courses are to be selected in consultation with the Biomolecular Engineering Graduate Advising Committee, the student, and the student's faculty mentor.

Ethics Course:

Choose one of the following courses:

BME 80G	Bioethics in the 21st Century: Science, Business, and Society	5
SOCY 268A	Science and Justice: Experiments in Collaboration	5

BME 80G can be taken to meet the ethics requirement, but the credits will not be counted toward the overall credit requirement for the Ph.D. since it is a lower-division course.

Graduate-Level Biomolecular Engineering Electives

Students must take at least two 5-credit, graduate-level BME courses. Alternative electives may be considered. Suitable courses are to be selected in consultation with the Biomolecular Engineering Graduate Advising Committee, the student, and the student's faculty advisor.

Seminars

BME 280B	Seminar on Bioinformatics and Bioengineering	2
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A minimum of six seminar courses, including at least two quarters of the 2-credit Biomolecular Engineering seminar. Because the intent of the seminar requirement is to ensure breadth of knowledge, laboratory group meetings (BME 281 courses) do not count for the seminar requirement.

Lab Rotations

Three research laboratory rotations (BME 296 - must enroll in fall and winter quarters of their first year) with different supervisors. Laboratory rotations for Ph.D.

students are generally completed in the first two quarters (three 7-week rotations).

BME 296	Research in Bioinformatics	5
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Bootcamp Activity

Entering graduate cohorts are strongly encouraged to participate in the hands-on "bootcamp" just before the start of the fall quarter. Bootcamp activities include program orientation, laboratory safety training, teaching assistant (TA) training, fellowship advice, cohort building activities, practical advice for navigating graduate school, and a hands-on research project.

Transfer Limitations

Up to two courses may be transferred from other graduate institutions with the approval of the faculty advisor and the graduate director.

Further Study Outside the Department

No further courses are required. However, with faculty guidance students often choose to take upper-division undergraduate courses or graduate courses outside the department to make up for deficiencies in background areas of particular importance.

With consent of the graduate director, variations in the composition of the required courses may be approved.

Foreign Language Requirements

Teaching Requirement

Pre-Qualifying Requirements

Qualifying Examination

Ph.D. students must select a faculty research adviser by the end of the first year. A qualifying examination committee is then formed in the second year, which consists of the adviser and three additional members, and which is approved by the graduate director and the campus graduate dean. At least two of the four must be members of the Department of Biomolecular Engineering. The student must submit a written dissertation proposal to all members of the committee and the graduate program adviser one month in advance of the examination. The dissertation proposal is publicly and formally presented in an oral qualifying examination given by the qualifying committee.

Ph.D. students are required to pass the qualifying examination and advance to candidacy by the end of their second year.

Post-Qualifying Requirements

Dissertation

Dissertation

Ph.D. candidates will submit the completed dissertation to a reading committee at least one month prior to the dissertation defense. The reading committee, formed

upon advancement to candidacy, consists of the dissertation supervisor and two readers appointed by the graduate director upon the recommendation of the dissertation supervisor. At least one of the three must be a member of the Department of Biomolecular Engineering.

Dissertation Defense

The candidate will present their research in a public seminar. The seminar will be followed by a defense of the dissertation to the reading committee and attending faculty, who will then decide whether the dissertation is acceptable or requires revision.

Academic Progress

Graduate students receiving two or more U (unsatisfactory) grades or grades below B- in courses relevant to the program are not making adequate progress and will be placed on academic probation for the next three quarters of registered enrollment.

Graduate students who fail (unsatisfactory or lower than B-) a relevant course while on probation may be dismissed from the program. Students may appeal their dismissal. Graduate students who fail a relevant course after being removed from probation are immediately returned to academic probation.

Graduate students experiencing circumstances that may adversely affect their academic performance should consult with their adviser and the graduate director.

Applying for Graduation

All candidates for a degree must submit an Application for PhD Degree to the Graduate Division by the date stated in the Academic and Administrative Calendar for the quarter they wish to receive the degree. The deadline for degree applications is typically in the second week of the quarter. For more information about applying for graduation, visit the Baskin School of Engineering Graduate Studies website.

[Optional Catchall]

Computational Media

Baskin School of Engineering
(831) 459-2158
<https://www.soe.ucsc.edu/>

PROGRAMS OFFERED

Computer Science: Computer Game Design B.S. (p. 448)

Computational Media M.S. (p. 454)

Computational Media Ph.D. (p. 457)

Computational Media Designated Emphasis (p. 453)

Games and Playable Media M.S. (p. 463)

Human Computer Interaction M.S. (p. 466)

Serious Games M.S. (p. 468)

OTHER PROGRAMS OF INTEREST

Art and Design: Games and Playable Media B.A. (p. 88)

Digital Arts and New Media M.F.A. (p. 28)

Film and Digital Media Ph.D. (p. 44)

Computational media includes the creation, enhancement, and study of media forms for which computational processes enable deeply interactive and generative experiences, as well as the use of computation to understand and assist creation of media broadly. The department emphasizes the construction of technologies that make possible novel media experiences and tools, while simultaneously embracing and engaging in theoretical and practical approaches from the arts, humanities, and social sciences. The Computational Media (CMPM) Department offers courses on a wide range of topics, many of which integrate technical subject matter with design-oriented, theoretical, and historical topics. The Computational Media Department administers an undergraduate bachelor of science (B.S.) degree in Computer Game Design, a master of science (M.S.) degree in Games and Playable Media, a master of science (M.S.) degree in Serious Games, a master of science (M.S.) degree in Human Computer Interaction, as well as a master of science (M.S.), a doctor of philosophy (Ph.D.), and a designated emphasis in Computational Media. Besides offering instructional courses, the department engages in a substantial research program in which both advanced undergraduates and graduate students participate.

COMPUTER SCIENCE: COMPUTER GAME DESIGN B.S.

Information and Policies

Introduction

The goal of this degree is to provide students a deep understanding of the technical aspects of computer game engineering and a broad background in the artistic, systemic, and production elements of game design and development. The core of the degree program is a strong grounding in computer science and computer engineering, preceded by a foundation in mathematics. Classes also develop skills in areas such as visual communication and team-oriented game production, while developing knowledge of topics such as game history, play experiences, game systems, and social and ethical issues. In their upper-division courses, students gain depth by taking electives in computational media and computer science and engineering, with options such as Game AI, Game Graphics and Real-Time Rendering, Generative Design (Procedural Content Generation), Mobile Applications, Interactive Storytelling, and Algorithmic Music. A two-course

interdisciplinary Game Development Experience and a yearlong interdisciplinary capstone Game Design Studio class allow students to develop substantial computer games and integrate materials from the rest of the program.

Academic Advising for the Program

The Baskin School of Engineering (BSOE) Undergraduate Advising Office is located in the Baskin Engineering Building, Room 225. It can be contacted by email at bsoeadvising@ucsc.edu or at the Undergraduate Advising website.

Transfer students to the program should consult the Transfer Students section of the Baskin Engineering Undergraduate Affairs page.

Getting Started in the Major

It is recommended that high school students intending to apply to the major have completed four years of mathematics (through advanced algebra and trigonometry) as well as any available courses in computer science, arts, and media (especially interactive media). Comparable college mathematics, arts, and media courses completed at other institutions also serve to properly prepare a student for the major.

Program Learning Outcomes

Recipients of a B.S. degree in Computer Game Design at UC Santa Cruz are expected to have the following skills and experiences:

1. Demonstrate mastery of computer science in the following core knowledge areas: algorithms, data structures, complexity, and software engineering and development.
2. Apply system-level perspective by thinking at multiple levels of detail and abstraction and by recognizing the context in which a computer system may function, including its interactions with people and the physical world.
3. Apply problem-solving skills and the knowledge of computer science to solve real problems.
4. Recognize and take into account the social, legal, ethical, and cultural issues in the discipline of computer games.
5. Demonstrate written and oral communication skills regarding technical material about computer science and computer games, broadly conceived.
6. Design and build a technical system that achieves an artistic goal for audience experience, employing sound computer science techniques.
7. Demonstrate the ability to collaboratively plan, organize, and execute complex, team-oriented projects, using appropriate communication and coordination techniques.

Major Qualification Policy and Declaration Process

Major Qualification

In order to be admitted into the Computer Science: Computer Game Design major, students must be listed as a proposed major within the School of Engineering. Please refer to <https://undergrad.soe.ucsc.edu/prepare-declare-bsoe-major>.

Transfers to the program should consult the Transfer Students section of the Baskin Engineering Undergraduate Affairs page.

In addition to being listed as a proposed School of Engineering major, admission to the Computer Science: Computer Game Design major is based on the following criteria:

Students have to complete all the foundation courses to qualify for the major

Students are required to take

CSE 16	Applied Discrete Mathematics	5
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And one of the following calculus courses

Either these courses		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5

or these courses		
MATH 20A	Honors Calculus	5

And a core programming sequence to include one of the following group of classes

Either these courses		
CSE 12	Computer Systems and Assembly Language and Lab	7
CSE 30	Programming Abstractions: Python	7
ECE 13	Computer Systems and C Programming	7
or these courses		
CSE 12	Computer Systems and Assembly Language and Lab	7
CSE 30	Programming Abstractions: Python	7
CSE 13S	Computer Systems and C Programming	7

Appeal Process

Denials of admission to the major may be appealed by submitting a letter to the School of Engineering Undergraduate Advising office, addressed to the computational media undergraduate director within 15

days from the date the notification was mailed. The appeal letter must describe why the prior performance is not an accurate reflection of the student's potential. Within 15 days of receipt of the appeal, the Undergraduate Advising office will notify the student and their college of the decision.

How to Declare a Major

Students should submit a petition to declare by completing the petition for major/minor declaration form as soon as they complete the major qualification courses or reach their declaration deadline quarter, whichever comes first.

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed major qualification courses.

There are five steps to declaring a BSOE major. For a detailed guide to this process, please consult Baskin Engineering's Declare Your Major website.

Transfer Information and Policy

Transfer Admission Screening Policy

The following courses or their equivalents are required prior to transfer, by the end of the spring term for students planning to enter in the fall:

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
CSE 16	Applied Discrete Mathematics	5
CSE 30	Programming Abstractions: Python	7

and one of the following courses

ECE 13	Computer Systems and C Programming	7
CSE 13S	Computer Systems and C Programming	7
CSE 12	Computer Systems and Assembly Language and Lab	7

Lecture and lab combinations count as one course.

In addition, completing all but one of the following courses prior to transfer is recommended to ensure timely graduation:

CSE 20	Beginning Programming in Python	5
CSE 12	Computer Systems and Assembly Language and Lab	7

One of these courses

AM 10	Mathematical Methods for Engineers I	5
MATH 21	Linear Algebra	5

One of these courses

ECE 13	Computer Systems and C Programming	7
CSE 13S	Computer Systems and C Programming	7

(Lecture-lab combinations count as one course.)

Getting Started at UCSC as a Transfer Student

Transfer students may declare the major at any time after coming to UCSC by following the steps in "How to Declare a Major."

Please note that most major courses have a strong theoretical component to prepare the student for designing, as opposed to simply using, technical and game systems. Often, other institutions' courses that emphasize applications of current programming languages and authoring tools do not count toward the major at UCSC. For specifics on the BSOE's transfer student policies, please see Baskin Engineering's Transfer Students website.

Letter Grade Policy

The Baskin School of Engineering requires letter grades for all courses in an engineering major.

[Optional Catchall]

Course Substitution Policy

Double Majors and Major/Minor Combinations Policy

Study Abroad

Honors

Students must obtain a GPA of 3.8 or higher in the courses in the major to be considered for the distinction of "Highest Honors in the Major." Students must obtain a GPA of 3.5 or higher in the courses in the major to be considered for the distinction of "Honors in the Major." The School of Engineering reserves the right to withhold honors based on other criteria, such as an incident of academic dishonesty.

[Optional Catchall]

School of Engineering Policies

Please refer to Admission to School of Engineering Majors (p. **Error! Bookmark not defined.**) in the School of Engineering section of the catalog for additional policies that apply to all School of Engineering programs. These policies include admission to the major and the

need for students to obtain preapproval before taking courses elsewhere.

Requirements and Planners

Course Requirements

The Computer Science: Computer Game Design curriculum has 24-26 courses (depending on the core programming sequence taken). Thirteen of the courses are upper-division. Several of the required courses and electives are also general education courses. Please consult with the schedule of classes or the General Catalog for more information.

Course requirements are divided into five conceptual areas and may not be credited in more than one area:

Lower-Division Courses

Upper-Division Courses

Mathematics

Choose one of the following options:

Either these courses

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

or these courses

MATH 20A	Honors Calculus	5
MATH 20B	Honors Calculus	5

Credit for one or both MATH 19A/MATH 19B may be granted with adequate performance on the CEEB calculus AB or BC Advanced Placement examinations.

Plus one of the following courses:

MATH 21	Linear Algebra	5
AM 10	Mathematical Methods for Engineers I	5

Plus the following course:

CSE 16	Applied Discrete Mathematics	5
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Computational Foundations

Choose one of the following options:

Either this course		
ECE 13	Computer Systems and C Programming	7
or this course		
CSE 13S	Computer Systems and C Programming	7

CSE 12 is a prerequisite for this course.

Plus all of the following courses:

CSE 20	Beginning Programming in Python	5
CSE 12	Computer Systems and Assembly Language and Lab	7
CSE 30	Programming Abstractions: Python	7
CSE 101	Introduction to Data Structures and Algorithms	5
CSE 111	Advanced Programming	5

Students with no prior programming will take CSE 20 before CSE 30 and CSE 12. Students with a prior programming course, AP credit, or clearing the “Test-out” bar will start with CSE 30 and CSE 12.

Games and Playable Media Foundations

Complete all of the following courses:

ARTG 80G	Visual Communication and Interaction Design	5
ARTG 80H	Critical History of Digital Games	5
FILM 80V	Video Games as Visual Culture	5

Game Design and Development

Complete all of the following courses.

CMPM 80K	Foundations of Video Game Design	5
ARTG 120	Game Design Experience	5
CMPM 120	Game Development Experience	5
CMPM 170	Game Design Studio I	5
CMPM 171	Game Design Studio II	7
CMPM 172	Game Design Studio III	7
CMPM 176	Game Systems	5

Computer Game Engineering

Complete five courses from the following list. The majority of these computer game engineering electives (CGEs) are technical practice electives which focus on the development and analysis of computational systems (the “programming” part of game creation). No more than two of the five can be from CMPM 131, CMPM 132, CMPM 150, CMPM 177, CSE 103, CSE 104 or ECON 166A. (These seven courses focus on other skills useful in computer game development, such as design, production, and mathematical analysis.)

NOTE: Lecture/lab combinations count as one course

CMPM 121	Game Technologies	5
CMPM 131	User Experience for Interactive Media	5
CMPM 132	Interaction Design Studio	5
CMPM 146	Game AI	5
CMPM 147	Generative Design	5

CMPM 148	Interactive Storytelling	5	CSE 184	Data Wrangling and Web Scraping	5	
CMPM 150	Creating Digital Audio	5	ECON 166A	Game Theory and Applications I	5	
CMPM 151	Algorithmic Music for Games	5	ECE 118	Introduction to Mechatronics	10	
CMPM 152	Musical Data	5	CMPM 179 may be repeated for credit, but only the first offering counts toward the computer game engineering requirement.			
CMPM 163	Game Graphics and Real-Time Rendering	5	Electives			
CMPM 164	Game Engines	5	Disciplinary Communication (DC) Requirement			
CMPM 169	Creative Coding	5	Students must satisfy the major's upper-division disciplinary communication (DC) requirement by completing the first course in the game design studio sequence:			
CMPM 177	Creative Strategies for Designing Interactive Media	5	CMPM 170	Game Design Studio I	5	
CMPM 178	Human-Centered Design Research	5	Comprehensive Requirement			
CMPM 179	Game Design Practicum	5	Students satisfy the senior comprehensive requirement by receiving a passing grade in all three courses of the game design studio sequence: CMPM 170, CMPM 171, and CMPM 172.			
CSE 102	Introduction to Analysis of Algorithms	5	Planners			
CSE 103	Computational Models	5	The following are three sample academic plans that students can use to plan their sequence of courses in the major. The first two plans are suggested guidelines for students who begin their studies in their frosh year. Such students, if they plan carefully, will have several openings free to take other breadth courses they find interesting.			
CSE 104	Computability and Computational Complexity	5	Plan one is for a student entering UCSC in their frosh year who is prepared to go directly into MATH 19A/MATH 20A and CSE 30.			
CSE 110A	Fundamentals of Compiler Design I	5	Plan two is for a student entering UCSC their frosh year who needs to take preparatory courses prior to MATH 19A or CSE 30 to ensure a successful outcome in those courses.			
CSE 110B	Fundamentals of Compiler Design II	5	Plan three is for a junior transfer student who has completed their mathematics, computational foundations, and general education requirements.			
CSE 113	Parallel and Concurrent Programming	5	Plan One			
CSE 112	Comparative Programming Languages	5		Fall	Winter	Spring
CSE 115A	Introduction to Software Engineering	5	Year 1	ARTG 80H	CMPM 80K	CSE 12
CSE 115B	Software Design Project	5		MATH 19A	MATH 19B or MATH 20B	
CSE 115C	Software Design Project II	5			CSE 30	
CSE 118	Mobile Applications	5	Year 2	ARTG 80G	FILM 80V	CMPM 120
CSE 119	Software for Society	5		MATH 21 or AM 10		ARTG 120
CSE 120	Computer Architecture	5				
CSE 131	Introduction to Operating Systems	5				
CSE 132	Computer Security	5				
CSE 138	Distributed Systems	5				
CSE 139	Data Storage Systems	5				
CSE 140	Artificial Intelligence	5				
CSE 142	Machine Learning	5				
CSE 143	Introduction to Natural Language Processing	5				
CSE 150	Introduction to Computer Networks	5				
CSE 160	Introduction to Computer Graphics	5				
CSE 161	Introduction to Data Visualization	5				
CSE 162	Advanced Computer Graphics and Animation	5				
CSE 163	Data Programming for Visualization	5				
CSE 180	Database Systems I	5				
CSE 181	Database Systems II	5				
CSE 183	Web Applications	5				

	ECE 13 or CSE 13S	CSE 16	CSE 101
Year 3	CSE 111	Game Engineering 1	Game Engineering 3
	CMPM 176	Game Engineering 2	Game Engineering 4
Year 4	CMPM 170 Game Engineering 5	CMPM 171	CMPM 172
Plan Two			
	Fall	Winter	Spring
Year 1	CSE 20	CMPM 80K	CSE 12
	MATH 3	CSE 30	MATH 19B
		MATH 19A	
Year 2	ARTG 80G	FILM 80V	CMPM 120
	ECE 13 or CSE 13S	MATH 21 or AM 10	ARTG 120
	ARTG 80H	CSE 16	CSE 101
Year 3	CSE 111	Game Engineering 1	Game Engineering 3
	CMPM 176	Game Engineering 2	Game Engineering 4
Year 4	CMPM 170 Game Engineering 5	CMPM 171	CMPM 172

In addition to the specific courses shown in the four-year planner, a student must complete courses satisfying the CC, ER, SR, SI, and TA general education requirements.

Plan Three

	Fall	Winter	Spring
Year	ARTG 80H	CMPM	CSE 111

Year 1 (Jr)	80K		
	ARTG 80G	FILM 80V	CMPM 120
	[OPEN]*	CSE 101	ARTG 120
Year 2 (Sr)	CMPM 170	CMPM 171	CMPM 172
	CMPM 176	Game Engineering 2	Game Engineering 4
	Game Engineering 1	Game Engineering 3	Game Engineering 5

*This planner assumes that, in addition to the minimum requirements for transfer students to be admitted to UCSC, students should also have completed the equivalents of all but one course from CSE 20, AM 10 or MATH 21, ECE 13 or CSE 13S, and CSE 12, as well as all general education requirements if they wish to graduate in two years. This slot in the planner is for any of those courses that the student may not have completed.

COMPUTATIONAL MEDIA DESIGNATED EMPHASIS

Introduction

The graduate designated emphasis (DE) leading to the degree notation “with an emphasis in Computational Media” provides specialization in the theory, principles, and practices of the field of computational media. This DE is administered by the Department of Computational Media. Students wishing to complete an M.F.A. or Ph.D. degree with an emphasis in this area must satisfy the degree requirements of a primary program as well as of the DE. The DE is most suitable for students pursuing degrees in computer science and engineering, digital art and new media, film and digital media, literature, and psychology. However, students from any area may work in this interdisciplinary field as long as they meet all requirements, including progress, within the primary degree program. It is intended for students in terminal degree programs (e.g., Ph.D., M.F.A.) rather than non-terminal master’s or certificate programs.

Requirements

Committee Composition and Departmental Approvals

The student’s M.F.A. thesis or capstone, Ph.D. qualifying exam, or Ph.D. dissertation committee must include one member of the Computational Media (CM) Department faculty.

Both the student’s CM adviser and the department’s graduate director must sign the student’s “Application for the Designated Emphasis in Computational Media” form, when the student’s DE is proposed. The graduate director

signs this form again when the DE is completed, and may approve exceptions either at the time of proposal or completion.

Course Requirements

All students must complete CMPM 201 (Introduction to Computational Media) and two additional 5-credit graduate courses offered or crosslisted by the CM department and/or faculty with (non-zero percentage) appointments in the department. One of the additional courses may be fulfilled through a graduate independent study (of 5 credits or greater) with a CM faculty member, with approval of the CM graduate director.

Writing, Research and/or Teaching Requirements

The student must complete a significant piece of computational media writing. Examples include a student's M.F.A. thesis (or substantial section of one) or a Ph.D. dissertation chapter—but other pieces of writing are also acceptable, at the discretion of the CM graduate director, including conference and journal publications.

[Optional Catchall]

COMPUTATIONAL MEDIA M.S.

Introduction

The goal of the M.S. in Computational Media (CM) is to help students build on existing strengths and move into new areas of computational media work. The design of the degree ensures, first, that students have a meaningful foundation in the key areas needed for undertaking interdisciplinary CM work. This may require some additional development in one or more areas (e.g., a sequence of computer programming classes). In addition, the M.S. coursework includes both broad and topical classes that help students understand the different ways that innovative work in CM connects the knowledge and methods of the different disciplines that contribute to it. Finally, the M.S. also includes a student-defined thesis, in which they demonstrate their ability to apply their foundational and integrative knowledge while developing novel work through supervised research. The M.S. is appropriate for students continuing in a variety of directions, including pursuing a terminal degree and performing innovative media creation.

M.S. students must complete a minimum of 35 quarter credits of graduate and upper-division courses, including 15 credits of core courses, 10 credits of topical courses, CMPM 204 (5 credits), and at least 2 credits of supervised research. No more than 15 credits may be upper-division undergraduate courses.

Requirements

Course Requirements

Core Courses (15 Credits)

CMPM 201	Introduction to Computational Media	5
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CMPM 202	Computation Media Research	5
CMPM 203	Computational Media Methods	5

Topics Courses (10 Credits)

M.S. students are required to take 10 credits of CM topics courses. This category includes all 5-credit CMPM graduate classes, as long as they are not already counted in another category (e.g., it cannot include core courses), in addition to courses available in other departments. Current topics courses are listed below.

Current Topics Courses

CMPM 235	User Evaluation of Technology	5
CMPM 237	Advanced Topics in Human-Robot Interaction	5
CMPM 243	Social Computing Research: Design, Algorithms, and Incentives	5
CMPM 244	Artificial Intelligence in Games	5
CMPM 248	Interactive Storytelling	5
CMPM 265	Generative Methods	5
CMPM 268	Immersive Analytics	5
CMPM 269	Machine Learning for Creativity and Design	5
CMPM 290A	Topics in Computational Media	5
CMPM 290J	Playable Media	5
CMPM 290K	Social and Emotional Approaches to Human Computer Interaction	5
CMPM 290P	Topics in Computational Cinematography	5
CSE 245	Computational Models of Discourse and Dialogue	5
CSE 260	Computer Graphics	5
CSE 261	Advanced Visualization	5
CSE 263	Data Driven Discovery and Visualization	5
CSE 265	Human-Computer Interaction	5
CSE 290L	Topics in Crowdsourcing and Collaboration	5
DANM 250A	Collaborative Research Project Group: Art and Science	5
DANM 250B	Collaborative Research Project Group: Socially Engaged Art	5
DANM 250C	Collaborative Research Project Group: Performance and Embodiment	5
DANM 250E	Collaborative Research Project Group: Experimental Play	5
FILM 228	Moving Image Archives and the Frontiers of Information	5
FILM 230	Expanded Documentary	5

FILM 234	Toward an Ethics of New Media	5
GAME 232	Advanced Game Technologies	5
GAME 238	Computer Graphics for Games	5
GAME 240	Game Usability	5
GAME 250	Foundations of Serious Games	5
GAME 251	Games User Research	5
GAME 290A	Advanced Topics in Games	5

DANM 250A, DANM 250B, DANM 250C, DANM 250E: can be repeated.

Other Requirements

In addition to the above curricular requirements, students are also required to satisfy the three Foundation Areas requirements. There are three additional program requirements, though students may have completed the necessary work for one or more before admission. Students are expected to demonstrate an understanding of the following three Foundation Areas:

- Media Creation in a CM context
- Computer Programming sufficient to carry out CM research
- Interpretive Practices sufficient to carry out CM research

Media Creation: All M.S. students must demonstrate an understanding of media creation in a CM context, and must do so by the end of their second year in the program. This can be completed by any of:

- The Computer Science: Computer Game Design B.S. game studio sequence (CMPM 170, CMPM 171, CMPM 172) before graduate enrollment.
- The Art and Design: Games and Playable Media B.A. game studio sequence (ARTG 170, ARTG 171, ARTG 172) before graduate enrollment.
- A Digital Arts and New Media (DANM) project group sequence (three DANM 250 courses in same area, in sequence) during or before computational media M.S./Ph.D. graduate enrollment.
- The Games and Playable Media M.S. project sequence (GAME 270, GAME 271, GAME 272) before computational media M.S./Ph.D. graduate enrollment (due to Professional Degree Supplemental Tuition (PDST) and cohort model, these cannot be taken by students in other programs).
- At least three graduate or upper-division undergraduate courses from a list of offerings at UCSC that require programming knowledge and

are focused on defining and developing CM-related projects (e.g., CMPM 148) during or before CM graduate enrollment. See the media creation courses list below.

- Petition to CM graduate director, presenting evidence of equivalent coursework at another institution and/or equivalent CM project experience in another context.

Computer Programming: All M.S. students must demonstrate an understanding of computer programming sufficient to carry out CM research, and must do so by the end of their second year in the program. This can be completed by:

- Taking a series of courses that integrate media and programming knowledge (e.g., GAME 235, GAME 236, and CMPM 120).
- Taking core programming (e.g., CSE 30 and CSE 101) and advanced programming (e.g., CSE 111) at UCSC or another institution.
- Petition to CM graduate director, presenting evidence of programming knowledge developed in another context.

Interpretive Practices: All M.S. students are expected to have an understanding of interpretive and critical methods sufficient to carry out CM research. Students who lack such a background are strongly encouraged to take a series of courses in this area, consulting with their advisor regarding which courses would be most appropriate. The appropriate Interpretive Practices for a given student depends on the specific research area for the student. The key is that the student is able to critique and intervene in their research area from a broader social, cultural, and historical perspective. One recommended sequence (which may or may not be appropriate for a specific student) is:

- HISC 1: Introduction to the History of Consciousness. If this is not possible, take an 80-level course that integrates introductory interpretive content (e.g., FILM 80V: Video Games as Visual Culture).
- Take two more graduate or upper-division undergraduate courses that focus on interpretive practices. The CM department offers courses that integrate this with CM knowledge, such as some offerings of CMPM 290A (e.g., Media Constellations) and CMPM 176: Game Systems. Other programs also offer courses that make this integration, such as DANM 201: Recent Methods and Approaches to Digital Arts and Culture and DANM 202: Dialogues and Questions in Digital Arts and Culture. Courses that do not make this integration, but that are connected to the student's research area, are also acceptable.

Note: In extraordinary circumstances the graduate director can reduce the number of required courses based on a petition presenting past accomplishments, for

example, reducing the number of required topics courses by one for each substantial past research publication or system accepted from the petition.

Current Media Creation Courses

CMPM 146	Game AI	5
CMPM 147	Generative Design	5
CMPM 148	Interactive Storytelling	5
CMPM 150	Creating Digital Audio	5
CMPM 151	Algorithmic Music for Games	5
CMPM 163	Game Graphics and Real-Time Rendering	5
CMPM 164	Game Engines	5
CMPM 169	Creative Coding	5
CMPM 179	Game Design Practicum	5
CMPM 244	Artificial Intelligence in Games	5
CMPM 248	Interactive Storytelling	5
CMPM 265	Generative Methods	5
CMPM 290J	Playable Media	5
CSE 160	Introduction to Computer Graphics	5
CSE 161	Introduction to Data Visualization	5
CSE 163	Data Programming for Visualization	5
CSE 183	Web Applications	5
CSE 245	Computational Models of Discourse and Dialogue	5
CSE 260	Computer Graphics	5
CSE 261	Advanced Visualization	5
CSE 263	Data Driven Discovery and Visualization	5
GAME 210	Game Art Intensive	5
GAME 215	Audio Direction	5

M.S. Research Thesis (7-10 credits)

The M.S. requires a research thesis. It is a substantial undertaking within the CM field, which may emphasize technical, media-creation, or interpretive aspects—or may emphasize more than one area equally. Regardless of which of the above areas the M.S. research emphasizes, a written thesis is required. This written thesis is reviewed by a committee of at least two faculty that must include at least one member of the CM department and draw half or more of its members from the UCSC academic senate. M.S. students are required to take CMPM 204 (Computational Media Project Definition), in which their thesis topic is developed, as well as CMPM 299, an independent study with the faculty advisor for their thesis.

CMPM 204	Computational Media Project Definition	5
CMPM 299	Thesis Research	

Lower-Division Courses

Students who are considering enrolling in lower-division courses in order to fulfill additional degree requirements (e.g., CSE 30, HISC 1) may wish to consult with the course instructor and their advisor about instead taking an

independent study or directed study (with the course instructor, their advisor, or a third faculty member) that subsumes the work of the course and adds additional content to bring it up to a graduate level. Graduate students must be enrolled in some combination of at least 10 credits of courses or independent studies that are either graduate or upper-division undergraduate courses in order to be considered full-time enrolled.

Transfer Credit

Up to 10 credits transferred from equivalent courses in previous graduate work at UCSC or elsewhere can be applied toward the M.S. course requirements. This can satisfy the topics requirement, but is not to exceed the three-course overall limit on transfers from outside institutions. A Course Substitution/Waiver form can be found on the Jack Baskin School of Engineering (BSOE) Graduate Advising website.

Review of Progress

On an ongoing basis, the faculty reviews the progress of every student remaining on track to complete the degree in six consecutive academic quarters. Students not making adequate progress toward completion of degree requirements (see the Graduate Handbook for policy on satisfactory academic progress) are subject to dismissal from the program. Students with academic deficiencies may be required to take additional courses. Full-time students with no academic deficiencies are normally expected to complete the degree requirements, which includes courses and a master's thesis, in two years.

Students receiving two or more unsatisfactory grades (U or grade below B) in School of Engineering (SoE) courses, or who receive an unsatisfactory grade (U or grade below B) in the Computational Media core course sequence (CMPM 201, CMPM 202, CMPM 203), are not making adequate progress and will be placed on academic probation for the following quarter of registered enrollment. Withdrawing or taking a leave of absence does not count as enrollment. Part-time enrollment is counted as a half quarter of enrollment. Students who are on academic probation or are not enrolled full time are no longer guaranteed any previously committed funding. Should students receive an unsatisfactory grade (U or below B) in a School of Engineering course while on probation, the Computational Media Department may request the graduate dean to dismiss that student from the graduate program. If after being removed from probation, the student again receives an unsatisfactory grade (U or below B) in a School of Engineering course, he or she will return immediately to academic probation.

Graduate students experiencing circumstances or difficulties that impact their academic performance should contact their advisor and the graduate director immediately. Students may appeal their dismissal.

Planners

M.S. in One Year (Student with technical CM B.S. degree)

This is a sample program for a student who has completed a bachelor's degree with significant technical content and a focus on some form of computational media (such as computer games). The B.S. in Computer Science: Computer Game Design at UCSC is such a degree. Such students will have already satisfied the requirement for understanding media creation in a CM context (e.g., by taking the CMPM 170, CMPM 171, and CMPM 172 sequence at UCSC) and the requirement for demonstrating an understanding of computer programming (e.g., by taking a core programming sequence and CSE 111 at UCSC). This program is for a student who wants to complete the M.S. degree in one year.

Fall	Winter	Spring
CMPM 201	CMPM 202	CMPM 203
Topics course	Topics course	CMPM 299 (2–5 credits)
CMPM 204	Elective/independent study (optional)	Elective/independent study (optional) (M.S. thesis approved)

M.S. in Five Quarters (Student requiring technical and interpretive foundation work)

This is a sample program for a student who has graduated from a digital media program or other undergraduate degree that provides experience in media creation in a CM context, but not an understanding of computer programming or interpretive practices. (CMPM 202 is moved to the second year, to reflect the need for computer programming knowledge before taking this course.)

	Fall	Winter	Spring
Year 1	CMPM 201	HISC 1	CMPM 203
	Topics course	Topics course	Interpretive graduate/upper-division course
	GAME 235	GAME 236	CMPM 120
Year 2	CMPM 204	CMPM 202	
	Interpretive graduate/upper-division course	CMPM 299 (2-5 credits)	
	Elective/Independent Study	Elective/Independent Study	

(optional)

(optional)
(M.S. thesis approved)

Applying for Graduation

Students planning to graduate should refer to the Baskin School of Engineering Graduate Studies website.

COMPUTATIONAL MEDIA PH.D.

Introduction

The Ph.D. in computational media (CM) is designed for those who are already actively working in computational media and want to develop new knowledge that will change what is possible and how we understand it. The Ph.D. program includes all the course requirements of the M.S., with the exception of those related to the M.S. thesis. Ph.D. students have a number of additional requirements, as well. First, they must take additional topics courses, building understanding of a broader set of CM approaches. Second, they must pass both a first-year exam and a comprehensive exam, setting clear milestones for the development of expert-level knowledge in CM. Third, they must engage in substantial independent research that contributes to the development of the field, working closely with CM research faculty. Fourth, they must propose, complete, and defend a significant and novel dissertation project. The Ph.D. is appropriate for those who aim to lead future CM research efforts, within the academy, industry, government, non-profit, and other contexts.

Advancement to Candidacy

Course Requirements

Ph.D. students will complete 15 credits of core courses, 20 credits of topics courses, and 12 credits of courses involved in preparation for the comprehensive examination.

Core Courses (15 Credits)

CMPM 201	Introduction to Computational Media	5
CMPM 202	Computation Media Research	5
CMPM 203	Computational Media Methods	5

Topics Courses (20 Credits)

Ph.D. students are required to take 20 credits of CM topics courses. The courses may be any combination of these types (as long as not already counted in another category):

- 5-credit CMPM graduate classes.

- Classes in other subject codes that cover the theory and/or practice of a CM area, as listed in the “topics courses.”
- Up to 10 credits transferred from equivalent courses in previous graduate work at UC Santa Cruz or elsewhere (not to exceed three course overall limit on transfers from outside institutions, between this and other requirements).

Current Topics Courses

CMPM 235	User Evaluation of Technology	5
CMPM 237	Advanced Topics in Human-Robot Interaction	5
CMPM 243	Social Computing Research: Design, Algorithms, and Incentives	5
CMPM 244	Artificial Intelligence in Games	5
CMPM 248	Interactive Storytelling	5
CMPM 265	Generative Methods	5
CMPM 268	Immersive Analytics	5
CMPM 269	Machine Learning for Creativity and Design	5
CMPM 290A	Topics in Computational Media	5
CMPM 290J	Playable Media	5
CMPM 290K	Social and Emotional Approaches to Human Computer Interaction	5
CMPM 290P	Topics in Computational Cinematography	5
CSE 245	Computational Models of Discourse and Dialogue	5
CSE 260	Computer Graphics	5
CSE 261	Advanced Visualization	5
CSE 263	Data Driven Discovery and Visualization	5
CSE 265	Human-Computer Interaction	5
CSE 290L	Topics in Crowdsourcing and Collaboration	5
DANM 250A	Collaborative Research Project Group: Art and Science	5
DANM 250B	Collaborative Research Project Group: Socially Engaged Art	5
DANM 250C	Collaborative Research Project Group: Performance and Embodiment	5
DANM 250E	Collaborative Research Project Group: Experimental Play	5
FILM 228	Moving Image Archives and the Frontiers of Information	5
FILM 230	Expanded Documentary	5
FILM 234	Toward an Ethics of New Media	5
GAME 232	Advanced Game Technologies	5

GAME 238	Computer Graphics for Games	5
GAME 240	Game Usability	5
GAME 250	Foundations of Serious Games	5
GAME 251	Games User Research	5
GAME 290A	Advanced Topics in Games	5

DANM 250A, DANM 250B, DANM 250C, and DANM 250E may be repeated.

Exam Courses (12 Credits)

CMPM 206	Computational Media Research Preparation	2
CMPM 297B	Independent Study or Research	10

CMPM 206: Teaches skills for gathering literature and preparing portfolio for comprehensive exam, taken the same quarter as exam. 2 credits.

CMPM 297B: Research in preparation for the comprehensive exam, usually taken with the student’s advisor. Students should enroll in 5 credits of CMPM 297B the quarter prior to their comprehensive exam, and then 5 credits alongside CMPM 206 the quarter they plan to take the comprehensive exam.

Additional Requirements

In addition to the above curricular requirements, students are also required to satisfy the three Foundation Areas requirements. Students may have completed the necessary work for one or more before admission. Students are expected to demonstrate an understanding of the following three Foundation Areas:

- Media Creation in a CM context
- Computer Programming sufficient to carry out CM research
- Interpretive Practices sufficient to carry out CM research

Media Creation: Ph.D. students must demonstrate an understanding of media creation in a CM context, and must do so by the end of their second year in the program—and before the comprehensive exam. This can be completed by any of:

- The Computer Science: Computer Game Design B.S. game studio sequence (CMPM 170, CMPM 171, CMPM 172) before graduate enrollment.
- The Art and Design: Games and Playable Media B.A. game studio sequence (ARTG 170, ARTG 171, ARTG 172) before graduate enrollment.
- A DANM project group sequence (three DANM 250 courses in same area, in sequence) during or before CM M.S./Ph.D. graduate enrollment.

- The Games and Playable Media M.S. project sequence (GAME 270, GAME 271, GAME 272) before CM MS/PhD graduate enrollment (due to PDST and cohort model, these cannot be taken by students in other programs).
- At least three graduate or upper-division undergraduate courses from a list of offerings at UCSC that require programming knowledge and are focused on defining and developing CM-related projects (e.g., CMPM 148) during or before CM graduate enrollment. See the list of media creation courses.
- Petition to CM graduate director, presenting evidence of equivalent coursework at another institution and/or equivalent CM project experience in another context.

Computer Programming: All Ph.D students must demonstrate an understanding of computer programming sufficient to carry out CM research, and must do so by the end of their second year in the program—and before the comprehensive exam. This can be completed by:

- Taking a series of courses that integrate media and programming knowledge (e.g., GAME 235, GAME 236, and CMPM 120).
- Taking core programming (e.g., CSE 30 and CSE 101) and advanced programming (e.g., CSE 111) at UCSC or another institution.
- Petition to CM graduate director, presenting evidence of programming knowledge developed in another context.

Interpretive Practices: All Ph.D. students are expected to have an understanding of interpretive and critical methods sufficient to carry out CM research. Students who lack such a background are strongly encouraged to take a series of courses in this area, consulting with their advisor regarding which courses would be most appropriate. The appropriate Interpretive Practices for a given student depends on the specific research area for the student. The key is that the student is able to critique and intervene in their research area from a broader social, cultural and historical perspective. One recommended sequence (which may or may not be appropriate for a specific student) is:

- HISC 1: Introduction to the History of Consciousness. If this is not possible, take an 80-level course that integrates introductory interpretive content (e.g., FILM 80V: Video Games as Visual Culture).
- Take two more graduate or upper-division undergraduate courses that focus on interpretive practices. The CM department offers courses that integrate this with CM knowledge, such as some offerings of CMPM 290A (e.g., Media Constellations) and CMPM 176: Game Systems. Other programs also offer courses that make this integration, such as DANM 201: Recent Methods

and Approaches to Digital Arts and Culture and DANM 202: Dialogues and Questions in Digital Arts and Culture. Courses that do not make this integration, but that are connected to the student's research area, are also acceptable.

The final determination that a student has satisfied the media creation, programming, and interpretation requirements is made during the comprehensive exam, including the portfolio review portion of the exam. The coursework suggested above is intended to provide students with the knowledge and skills to successfully pass their comprehensive exam, and to provide appropriate projects for the portfolio portion of the exam. A student should consult with both their advisor and the grad director to determine the best path for being prepared for the comprehensive exam.

Note: In extraordinary circumstances the graduate director can reduce the number of required courses based on a petition presenting past accomplishments. For example, reducing the number of required topics courses by one for each substantial past research publication or system accepted from the petition.

Current Media Creation Courses

CMPM 146	Game AI	5
CMPM 147	Generative Design	5
CMPM 148	Interactive Storytelling	5
CMPM 150	Creating Digital Audio	5
CMPM 151	Algorithmic Music for Games	5
CMPM 163	Game Graphics and Real-Time Rendering	5
CMPM 164	Game Engines	5
CMPM 169	Creative Coding	5
CMPM 179	Game Design Practicum	5
CMPM 244	Artificial Intelligence in Games	5
CMPM 248	Interactive Storytelling	5
CMPM 265	Generative Methods	5
CMPM 290J	Playable Media	5
CSE 160	Introduction to Computer Graphics	5
CSE 260	Computer Graphics	5
CSE 161	Introduction to Data Visualization	5
CSE 163	Data Programming for Visualization	5
CSE 183	Web Applications	5
CSE 245	Computational Models of Discourse and Dialogue	5
CSE 261	Advanced Visualization	5
CSE 263	Data Driven Discovery and Visualization	5
GAME 210	Game Art Intensive	5
GAME 215	Audio Direction	5

Lower-Division Courses

Students who are considering enrolling in lower-division courses in order to fulfill additional degree requirements (e.g., CSE 30, HISC 1) may wish to consult with the

course instructor and their advisor about instead taking an independent study or directed study (with the course instructor, their advisor, or a third faculty member) that subsumes the work of the course and adds additional content to bring it up to a graduate level. Graduate students must be enrolled in some combination of at least 10 credits of courses or independent studies that are either graduate or upper-division undergraduate courses in order to be considered full-time enrolled.

Teaching Requirement

Pre-Qualifying Requirements

The Ph.D. requires two examinations before the qualifying examination.

First-Year Examination

The Ph.D. first-year exam measures students' understanding of, and ability to synthesize and apply core computational media knowledge (history, theory, research approaches, and evaluation methods). This is the material covered in the CM core courses. The first-year exam must be taken the spring of the year in which students finish their core coursework—which should be the first year, unless students need additional foundation work before taking one of the core courses, in which case it may be the second year.

There are three possible outcomes of the first-year exam:

- Pass at Ph.D. level
- Pass at M.S. level
- Fail

Students who pass at the Ph.D. level are done with the exam. Students who pass at the M.S. level may elect to leave the program with an M.S., upon completion of all M.S. requirements. Both students who pass at the M.S. level and students who fail have the option to take the exam again, in the immediately following summer offering (unless granted an exception to take it the following academic year). Students who take the exam again may not decrease their outcome (e.g., a student who passes at the M.S. level in spring, then fails in summer, retains the option of completing the M.S.). Students may only take the exam twice. Students are recommended for dismissal from the program immediately if they either (a) fail twice or (b) fail once and elect not to take the exam again.

In extraordinary circumstances the graduate director may give a student the option of taking the first-year exam without having taken the core coursework (CMPM 201, CMPM 202, and CMPM 203) during any quarter. Those who pass may complete the degree without taking the core courses.

Ph.D. Comprehensive Examination

The Ph.D. comprehensive exam measures students' preparation to perform independent CM research. It must be taken (for the first time) no later than the end of a

student's third year in the program (the ninth quarter, excluding summer quarters). Before taking the exam, students must have completed the preparatory coursework for understanding media creation and computer programming, as well as demonstrated an understanding of interpretive practices (Foundation Areas, as outlined above). The quarter prior to taking the comprehensive exam, students enroll in a 5-credit independent study (CMPM 297B) with their advisor to prepare for the exam. During the quarter in which they plan to take the exam, students enroll in CMPM 206 (a 2-credit course, usually offered by the CM graduate director each quarter) and a 5-credit independent study (CMPM 297B, usually with their advisor), and take an exam evaluated by advisor and graduate director (with another faculty member stepping in if advisor is graduate director). The exam itself includes two components, a literature review and portfolio:

- Literature Review: Reading a significant body of material in two or three depth areas of CM—from a list developed by the student, advisor, and course instructor—integrating it, and writing one or more essays about it.
- Portfolio: A portfolio review of CM projects, with (a) a detailed written description of the computational system-building goals and process of at least one project led (in this aspect) by the student and (b) a detailed written description of the media-making goals and process of at least one project led (in this aspect) by the student. The projects may be from during or before enrollment in the program, and the written descriptions may be of the same or different projects.

There are three possible outcomes of the comprehensive exam:

- Pass at Ph.D. level
- Pass at M.S. level
- Fail

As with the first-year exam, students who pass the comprehensive exam at the Ph.D. level are done with the exam. Students who pass at the M.S. level may elect to leave the program with an M.S., upon completion of all M.S. requirements. Both students who pass at the M.S. level and students who fail have the option to take the exam again, in a future quarter, not later than the middle of their fourth year in the program (the 11th quarter, excluding summer quarters). Students who take the exam again may not decrease their outcome (e.g., a student who passes at the M.S. level in spring, then fails the following fall, retains the option of completing the M.S.). Students may only take the exam twice. Students are recommended for dismissal from the program immediately if they either (a) fail twice or (b) fail once and elect not to take the exam again.

Qualifying Examination

Qualifying Examination and Advancement to Candidacy

The Ph.D. qualifying examination (QE) measures students' preparation to begin Ph.D. research. It must be taken (for the first time) no later than the end of a student's fourth year in the program (the 12th quarter, excluding summer quarters). It has two parts: first, a detailed written description of a proposed dissertation project, distributed to the committee before the oral examination; second, an oral presentation of the project, followed by questioning from the committee.

The committee policy for the CM Ph.D. follows that of UC Santa Cruz. Specifically: The qualifying examination committee shall consist of at least four examiners, one of whom is not a member of the student's department. The department shall submit to the Office of the Graduate Dean at least one month before the proposed examination a list of four qualified persons who are willing to serve on the examination committee, and who meet the following conditions:

- The chair of the examination committee must be a tenured faculty member.
- The student's thesis advisor cannot chair the examination committee.
- The outside member must be (a) a tenured faculty member from a different discipline on the University of California, Santa Cruz, campus, (b) a tenured faculty member of the same or different discipline from another academic institution involved in research and graduate education, or (c) a qualified person outside of academia with significant research experience (as determined by the Graduate Division).

After passing the qualifying examination, students advance to candidacy. Students who do not pass the examination may take it again, but must do so no later than the end of their fifth year in the program. Students may only take the examination twice. Students are recommended for dismissal from the program immediately if they either (a) fail twice or (b) fail once and elect not to take the examination again.

Planners

Ph.D., Not Seeking M.S. Degree (Students with Technical CM M.S. Degree)

This is a sample program for a student who has completed a master's degree with significant technical content and a focus on some form of computational media (such as computer games). The M.S. in games and playable media at UC Santa Cruz (offered in Silicon Valley) is such a degree. Such students will have already satisfied the requirement for understanding media creation in a CM context (e.g., by taking the GAME 270, GAME 271, and GAME 272 sequence at UCSC) and the requirement for demonstrating an understanding of

computer programming (such master's degrees generally only accept students who know how to program). This program is for a student who wants to complete the Ph.D. without getting a second M.S. in the process.

	Fall	Winter	Spring
Year 1	CMPM 201 Topics course Topics course	CMPM 202 Topics course	CMPM 203 Topics course CMPM 297A (5 credits) (First-Year Exam)
Year 2	CMPM 206 (2 credits)	CMPM 297C (15 credits)	CMPM 297B (10 credits)
	CMPM 297B (10 credits) (Passes Comprehensive Exam)		CMPM 297A (5 credits) (Passes Qualifying Exam/Advances to Candidacy)
Year 3	CMPM 299 (15 credits)	CMPM 299 (15 credits)	CMPM 299 (15 credits)
Year 4	CMPM 299 (15 credits)	CMPM 299 (15 credits)	CMPM 299 (15 credits) (Dissertation Defense)

Ph.D., Seeking M.S. Degree (Students with Non-technical Master's Degree)

This is a sample program for a student who has completed a master's degree with significant arts content and a focus on some form of computational media (such as digital art). The M.F.A. in digital art and new media at UC Santa Cruz is such a degree. Such students will have already satisfied the requirement for understanding media creation in a CM context (e.g., by taking one of the DANM 250 sequences at UCSC) but not necessarily the

requirement for demonstrating an understanding of computer programming (such master's degrees generally focus on the strength of the student's arts portfolio, rather than technical skills). This program is for a student who wants to complete the Ph.D. while getting an M.S. in the process.

	Fall	Winter	Spring
Year 1	CMPM 201 Topics course	Topics course GAME 236	CMPM 203 Topics course
Year 2	GAME 235 CMPM 297B (10 credits) Topics course	CMPM 202 CMPM 297B (10 credits)	CMPM 120 CMPM 297C (15 credits) (First-Year Exam)
Year 3	CMPM 206 CMPM 297B (10 credits) (Passes Comprehensive Exam)	CMPM 297C (15 credits)	CMPM 297B (10 credits) CMPM 297A (5 credits) (Passes Qualifying Exam/Advances to Candidacy)
Year 4	CMPM 299 (15 credits)	CMPM 299 (15 credits)	CMPM 299 (15 credits)
Year 5	CMPM 299 (15 credits)	CMPM 299 (15 credits)	CMPM 299 (15 credits) (Dissertation Defense)

Ph.D., Also Seeking M.S. Degree (Students with Technical Non-CM B.S.)

This is a sample program for a student who has completed a bachelor's degree with significant technical content but little focus on any form of computational media. The B.S. in computer science at UC Santa Cruz is such a degree. Such students will have already satisfied the requirement for demonstrating an understanding of computer programming (e.g., by taking a core programming sequence and CSE 111 at UCSC) though students strongly focused on theoretical computer science may need to take an advanced programming course. This program is for a student who wants to complete the M.S. degree on the way to the Ph.D.

	Fall	Winter	Spring
Year 1	CMPM 201 Topics course CMPM 179	CMPM 202 Topics course CMPM 148	CMPM 203 Topics course CMPM 290J (First-Year Exam)
Year 2	CMPM 204 Topics course CMPM 297	CMPM 297B (10 credits) CMPM 299 (2 credits) (M.S. Thesis Approved)	CMPM 297C (15 credits)
Year 3	CMPM 206 CMPM 297B (10 credits) (Passes Comprehensive Exam)	CMPM 297C (15 credits)	CMPM 297B (10 credits) CMPM 297A (5 credits) (Passes Qualifying Exam/Advances to Candidacy)
Year 4	CMPM 299 (15 credits)	CMPM 299 (15 credits)	CMPM 299 (15 credits)
Year 5	CMPM 299 (15 credits)	CMPM 299 (15 credits)	CMPM 299 (15 credits) (Dissertation Defense)

(Dissertation Defense)

Transfer Credit

Up to 10 credits transferred from equivalent courses in previous graduate work at UC Santa Cruz or elsewhere can be applied toward the Ph.D. course requirements. This can partially satisfy the topics requirement, but is not to exceed the three-course overall limit on transfers from outside institutions. A Course Substitution/Waiver form can be found on the BSOE Graduate Advising webpage.

[Optional Catchall]

Dissertation

Dissertation

The Ph.D. dissertation is a significant contribution to the CM field. It may emphasize technical, media-creation, or interpretive aspects, but must have a significant secondary contribution from at least one of the other areas—and may also emphasize areas equally. It requires an oral defense before a faculty committee, as well as a final dissertation document reviewed by that committee (distributed to the committee before the defense, and revised after the defense in response to committee comments). The committee must include at least two members of the CM Department.

Dissertation Defense

Academic Progress

As noted above, in order to remain in good academic standing, students must:

- Take the first-year exam (for the first time) the spring of the year they finish the core coursework, which should be the first year unless students need additional foundation work, in which case it may be the second year. Students who fail have the option to take the exam again, in the immediately following summer offering (unless granted an exception to take it the following academic year). Students may only take the exam twice. Students are recommended for dismissal from the program immediately if they either (a) fail twice or (b) fail once and elect not to take the exam again.
- Take the comprehensive exam (for the first time) no later than the end of a student's third year in the program (the ninth quarter, excluding summer quarters). Students who fail have the option to take the exam again, in a future quarter, not later than the middle of their fourth year in the program (the 11th quarter, excluding summer quarters). Students may only take the exam twice. Students are recommended for dismissal from the program immediately if they either (a) fail twice or (b) fail once and elect not to take the exam again.
- Take the qualifying exam (for the first time) no later than the end of a student's fourth year in the

program (the 12th quarter, excluding summer quarters). Students who do not pass the examination may take it again, but must do so no later than the end of their fifth year in the program. Students may only take the examination twice. Students are recommended for dismissal from the program immediately if they either (a) fail twice or (b) fail once and elect not to take the examination again.

In addition, because the primary work in the Ph.D. is independent research under the supervision of a faculty advisor, students are expected to be working with a research advisor at all times. This advisor must either be a voting member of the Computational Media Department faculty or another UCSC faculty member granted advisor status by the department in the student's case (either at the time of the student's admission or at a later point). Any student who ends a term without a faculty advisor will be issued a warning. If a student ends two academic quarters without an advisor they will be recommended for dismissal from the program immediately, unless granted an exception.

Applying for Graduation

Students planning to graduate should refer to the Baskin School of Engineering Graduate Studies website.

[Optional Catchall]

GAMES AND PLAYABLE MEDIA M.S.

Introduction

The M.S. in games and playable media prepares students to make professional contributions to the creation of games and other forms of media that invite and structure play. The degree is offered through the UC Santa Cruz location in Silicon Valley, enabling connection and collaboration with local industry. The curriculum includes deep engagement with game creation as well as a focus on professional development. Students can also take advantage of the opportunities for coursework and collaboration offered by its "sister" degree, the M.S. in serious games (also offered in Silicon Valley), as well as course offerings in games and related technologies on the Santa Cruz campus, and the potential for connections with the department's field-leading research groups.

The curriculum covers four core competencies: (1) game design and development, which includes working in a group to design, develop software experiences, elicit user input and test the user experience; (2) game development technologies, including gameplay programming techniques and knowledge of game engines and middleware; (3) knowledge and working practice in industry-standard tools for collaboration and project management, source code management, and content creation; and (4) specialized concentrations in areas such as development of alternative input devices, level design, game audio, game narrative, and others.

The M.S. in Games and Playable Media is a five-quarter program that spans one and two-thirds academic years. Students are expected to complete coursework in five academic quarters, without leaves of absence.

Requirements

Course Requirements

All students are required to take 60 credits to complete the M.S.. Required courses are as follows:

All of the following courses:

GAME 200	Game Design Systems	5
GAME 221	Professional Development for Game Makers I	2
GAME 231	Game Technologies	5
GAME 270	Games and Playable Media Studio I	5
GAME 271	Games and Playable Media Studio II	5
GAME 272	Games and Playable Media Studio III	5
GAME 280A	Games Proseminar	2

GAME 280A must be taken a minimum of two times.

Plus one of the following options:

Either this course		
GAME 230	Fundamentals of Game Engineering	5
or these courses		
GAME 235	Game Development I	5
GAME 236	Game Development II	5

Students who lack sufficient technical preparation to enter course Games and Playable Media GAME 230, Fundamentals of Game Engineering, must take both GAME 235, Game Development I, and GAME 236, Game Development II. Assessment of technical preparation will be performed based on completed coursework prior to entry into the program, discussion with the student, and, at the program's discretion, use of a technical assessment examination.

Three courses from the electives list below, 15 credits (5 credits each)

CMPM 235	User Evaluation of Technology	5
CMPM 244	Artificial Intelligence in Games	5
CMPM 248	Interactive Storytelling	5
CMPM 265	Generative Methods	5
CMPM 290J	Playable Media	5
CMPM 297	Independent Study	5
DANM 201	Recent Methods and Approaches to Digital Arts and Culture	5
DANM 202	Dialogues and Questions in Digital Arts and Culture	5

DANM 219	Introduction to Electronics for Artmaking	5
DANM 241B	Modern Art: Cubism to Pop	5
DANM 250E	Collaborative Research Project Group: Experimental Play	5
DANM 254I	Empirical Approaches to Art Information	5
DANM 281	Special Topics in Digital Arts and New Media	5
GAME 201	Level Design	5
GAME 202	Foundations of Alternative Controller Games	5
GAME 210	Game Art Intensive	5
GAME 215	Audio Direction	5
GAME 232	Advanced Game Technologies	5
GAME 238	Computer Graphics for Games	5
GAME 240	Game Usability	5
GAME 250	Foundations of Serious Games	5
GAME 251	Games User Research	5
GAME 252	Modeling and Simulation	5
GAME 290A	Advanced Topics in Games	5
MUSC 206B	Computer-Assisted Composition	5

Credit for various CMPM 297 options varies. A maximum of five credits of Computational Media 297 (Independent Study or Research) can be used to meet degree requirements.

Master's Capstone Project

Completion of a master's capstone project is required for the master's degree. These are generally collaborative projects, created together with other students in the Games and Playable Media M.S. program. Projects are typically completed by students during GAME 272, Games and Playable Media Studio III. Students are evaluated based both on their individual contributions to the project and on the overall success of the project as a whole. Each project will be demonstrated via a public presentation, and this demonstration comprises part of the final project evaluation.

Evaluation of projects is performed by a committee consisting of at least three people, comprised of at least the games and playable media vice chair and will contain other members of the games and playable media program faculty, or members of the games and playable media program advisory committee, or other instructors in the games and playable media program. A majority of the committee's voting members are members of the UC Santa Cruz academic senate.

Planners

There are two primary paths through the first year of the degree. Students with less technical background take GAME 235 and GAME 236 in their first year, while

those with more technical background take GAME 230 in their first year. All students, regardless of whether they do GAME 235 and GAME 236 or GAME 230, are required to complete at least 60 credits.

The sample programs include summer internships or sponsored projects. These are not required, and do not bear academic credit. They are, however, strongly suggested.

Sample program for students with more technical background

Fall Quarter 1	GAME 230, Fundamentals of Game Engineering (5 credits)
	GAME 200, Game Design Systems (5 credits)
	GAME 280A, Games Proseminar (2 credits)
Winter Quarter 2	Elective 1 (5 credits)
	Elective 2 (5 credits)
	GAME 280A, Games Proseminar (2 credits)
Spring Quarter 3	GAME 231, Game Technologies (5 credits)
	GAME 270, Games and Playable Media Studio 1 (5 credits)
	GAME 221, Professional Development for Game Makers I (2 credits)
Summer	Internship or Sponsored Project
Fall Quarter 4	GAME 271, Games and Playable Media Studio II
	Elective 3 (5 credits)
	GAME 280A, Games Proseminar (2 credits)
Winter Quarter 5	GAME 272, Games and Playable Media Studio III (5 credits)
	Elective 4 (5 credits)
	GAME 280A, Games Proseminar (2 credits)

Sample program for students with less technical background

Fall Quarter 1	GAME 235, Development I (5 credits)
	GAME 200, Game Design Systems (5 credits)
	GAME 280A, Games Proseminar (2 credits)
Winter Quarter 2	GAME 236, Game Development II (5 credits)

	Elective 1 (5 credits)
	GAME 280A, Games Proseminar (2 credits)
Spring Quarter 3	GAME 231, Game Technologies (5 credits)
	GAME 270, Games and Playable Media Studio 1 (5 credits)
	GAME 221, Professional Development for Game Makers (5 credits)
Summer	Internship or Sponsored Project
Fall Quarter 4	GAME 271, Games and Playable Media Studio II
	Elective 2 (5 credits)
	GAME 280A, Games Proseminar (2 credits)
Winter Quarter 5	GAME 272, Games and Playable Media Studio III (5 credits)
	Elective 3 (5 credits)
	GAME 280A, Games Proseminar (2 credits)

Transfer Credit

Up to three School of Engineering courses fulfilling the degree requirements of the M.S. degree may be taken before beginning the graduate program through the concurrent enrollment program. The game art, game writing, and game sound requirements of the M.S. program may also be satisfied through courses from other institutions or prior UCSC coursework. Petitions should be submitted along with the transcript from the other institution. For courses taken at other institutions, copies of the syllabi, examinations, and other coursework should accompany the petition. Such petitions are not considered until the completion of at least one quarter at UCSC.

At most, a total of three courses may be transferred from concurrent enrollment and other institutions.

Review of Progress

On an ongoing basis, the faculty reviews the progress of every student remaining on track to complete the degree in five consecutive academic quarters. Students not making adequate progress toward completion of degree requirements (see the Graduate Handbook for policy on satisfactory academic progress) are subject to dismissal from the program. Students with academic deficiencies may be required to take additional courses. Full-time students with no academic deficiencies are normally expected to complete the degree requirements at the rate of at least two courses per quarter, and move forward through the course sequences together with their cohort, remaining on track to complete the degree in five academic quarters.

Students receiving two or more unsatisfactory grades (U or grade below B) in the School of Engineering (SoE) courses, or who receive an unsatisfactory grade (U or grade below B) in a course in the Games and Playable Media Studio sequence, are not making adequate progress and will be placed on academic probation for the following quarter of registered enrollment. Withdrawing or taking a leave of absence does not count as enrollment. Part-time enrollment is counted as a half quarter of enrollment. Students who are on academic probation or are not enrolled full time are no longer guaranteed any previously committed funding. Should students receive an unsatisfactory grade (U or below B) in a School of Engineering course while on probation, the Computational Media Department may request the graduate dean to dismiss that student from the graduate program. If after being removed from probation, the student again receives an unsatisfactory grade (U or below B) in a School of Engineering course, he or she will return immediately to academic probation.

Graduate students experiencing circumstances or difficulties that impact their academic performance should contact their advisor and the graduate director immediately. Students may appeal their dismissal.

Applying for Graduation

Students planning to graduate should refer to the Baskin School of Engineering Graduate Studies website.

HUMAN COMPUTER INTERACTION M.S.

Introduction

The Master's of Science (M.S.) in Human Computer Interaction aims to train students in core skills for human-computer interaction professionals: design methodologies, prototyping and technical build skills, eliciting and integrating subject matter knowledge, designing and conducting efficacy measurements, effective teamwork, and career planning—all within the context of user experience and interaction. The curriculum is designed to accommodate students who have expertise in the social sciences, technical skills, and/or subject matter knowledge. Students with varying knowledge will be intentionally mixed together in coursework, in order to maximize peer learning and collaboration across strengths. The degree is offered through the UC Santa Cruz location in Silicon Valley, alongside the Games + Playable Media, Serious Games, and Natural Language Processing M.S. degrees, to enable students to connect and collaborate across programs and with local industry leaders.

The M.S. in Human Computer Interaction is a four-quarter program that begins in fall quarter, includes career planning courses and activities, and encourages student internships during summer. Students are expected

to complete coursework in four academic quarters, without leaves of absence.

Requirements

Course Requirements

All students are required to complete at least 53 credits for the M.S. The required courses are as follows:

All of the following courses:

HCI 200	Introduction to HCI	5
HCI 201	Introduction to Design Methods in HCI	5
HCI 203	Introduction to Research	5
HCI 271	HCI Capstone 1	5
HCI 272	Capstone 2	5

Plus one of the following courses:

HCI 202A	Introduction to HCI Build: Bootcamp	5
HCI 202B	Introduction to Build: Advanced	5

Students with less technical background should enroll in HCI 202A, while students with more technical background should enroll in the advanced course HCI 202B. The courses share some class time and will, therefore, be delivered during the same quarter.

Plus this two-credit course which must be taken every academic quarter:

HCI 290	HCI Seminar	2
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HCI 290 must be taken every quarter for a total of four times (8 credits).

Two courses from the elective list below:

All students are required to enroll and pass (letter grade "B-" or better or an "S" grade) in a minimum of two elective courses chosen from the list below.

ART 184	3D Art and Design: Laser Cutting and CNC Routing	5
ART 185	3D Art and Design II	5
CMPM 201	Introduction to Computational Media Research	5
CMPM 202	Computation Media Research	5
CMPM 203	Computational Media Methods	5
CMPM 235	User Evaluation of Technology	5
CMPM 243	Social Computing Research: Design, Algorithms, and Incentives	5
CMPM 290J	Playable Media	5
CMPM 297A	Independent Study or Research	5
FILM 225	Software Studies	5
FILM 232	Audiovisual Ethnography	5
FILM 283	New Media Art and Digital Culture	5

GAME 200	Game Design Systems	5
GAME 210	Game Art Intensive	5
GAME 215	Audio Direction	5
GAME 231	Game Technologies	5
GAME 232	Advanced Game Technologies	5
GAME 240	Game Usability	5
GAME 250	Foundations of Serious Games	5
GAME 251	Games User Research	5
GAME 290A	Advanced Topics in Games	5

A maximum of five credits of CPM 297A, Independent Study or Research, can be used to meet degree requirements.

Master's Capstone Project

Completion of a master's capstone project is required for the M.S. degree. All students are required to take the capstone sequence (HCI 271 and HCI 272), in which they collaborate to develop an interactive system and measure its efficacy. The capstone sequence also includes professional development modules in its curriculum. During HCI 271, Capstone I, students form project teams, brainstorm and iterate ideas for the capstone projects, culminating in approved briefs and project teams, including an approved committee of advisors for each project. Advisors may be local industry professionals (including industry partners who have proposed projects), or may also be UC Santa Cruz faculty from the main campus. HCI 272, Capstone II, is a double-weighted course (10 credits) in which students produce their capstone projects through extensive workshopping, critique, and testing. The quarter culminates in a showcase of student work.

Evaluation of projects is performed by a committee consisting of at least three people, including the HCI vice chair. The committee will also contain other members of the HCI program faculty, or members of the HCI program advisory committee, or other instructors in the HCI program. A majority of the committee's voting members are members of the UC Santa Cruz academic senate.

Planners

There are two primary paths through the first year of the degree that require the same number of courses. Students with less technical background take HCI 202A, while those with more technical background take HCI 202B. The sample programs include summer internships or sponsored projects. These are not required, and do not bear academic credit. They are, however, strongly recommended.

Sample program for students with less technical background

Fall Quarter 1	HCI 200, Foundations of HCI (5 credits)
	HCI 201, Introduction to Design Methods in HCI (5 credits)

	HCI 290, HCI Seminar (2 credits)
Winter Quarter 2	HCI 202A, Introduction to HCI Build, Bootcamp (5 credits)
	Elective 1 (5 credits)
	HCI 290, HCI Seminar (2 credits)
Spring Quarter 3	HCI 271, Capstone I (5 credits)
	HCI 203, Introduction to Research (5 credits)
	HCI 290, HCI Seminar (2 credits)
Summer	Internship or Sponsored Project
Fall Quarter 4	HCI 272, Capstone II (10 credits)
	Elective 2 (5 credits)
	HCI 290, HCI Seminar (2 credits)

Sample program for students with more technical background

Fall Quarter 1	HCI 200, Foundations of HCI (5 credits)
	HCI 201, Introduction to Design Methods in HCI (5 credits)
	HCI 290, HCI Seminar (2 credits)
Winter Quarter 2	HCI 202B, Introduction to HCI Build, Advanced (5 credits)
	Elective 1 (5 credits)
	HCI 290, HCI Seminar (2 credits)
Spring Quarter 3	HCI 271, Capstone I (5 credits)
	HCI 203, Introduction to Research (5 credits)
	HCI 290, HCI Seminar (2 credits)
Summer	Internship or Sponsored Project
Fall Quarter 4	HCI 272, Capstone II (10 credits)
	Elective 2 (5 credits)
	HCI 290, HCI Seminar (2 credits)

Transfer Credit

Up to three School of Engineering courses fulfilling the degree requirements of the M.S. degree may be taken before beginning the graduate program through the concurrent enrollment program. One of the three core introduction classes (Intro to Build, Intro to Methods, and Intro to Design) may also be satisfied through courses from other institutions or prior UC Santa Cruz coursework. Petitions should be submitted along with the transcript from the other institution. For courses taken at other institutions, copies of the syllabi, examinations, and other coursework should accompany the petition. Such

petitions are not considered until the completion of at least one quarter at UC Santa Cruz.

At most, a total of three courses may be transferred from concurrent enrollment and other institutions.

Review of Progress

On an ongoing basis, the faculty reviews the progress of every student so they remain on track to complete the degree in four consecutive academic quarters. Students not making adequate progress toward completion of degree requirements (see the Graduate Handbook for policy on satisfactory academic progress) are subject to dismissal from the program. Students with academic deficiencies may be required to take additional courses. Full-time students with no academic deficiencies are normally expected to complete the degree requirements at the rate of at least two courses per quarter, and move forward through the course sequences together with their cohort, remaining on track to complete the degree in a single four-quarter year.

Students receiving two or more unsatisfactory grades (U or grade below B) in the School of Engineering (SoE) courses, or who receive an unsatisfactory grade (U or grade below B) in a course in the HCI capstone sequence, are not making adequate progress and will be placed on academic probation for the following quarter of registered enrollment. Withdrawing or taking a leave of absence does not count as enrollment. Part-time enrollment is counted as a half quarter of enrollment. Students who are on academic probation or are not enrolled full time are no longer guaranteed any previously committed funding. Should students receive an unsatisfactory grade (U or below B) in a School of Engineering course while on probation, the Computational Media Department may request the graduate dean to dismiss that student from the graduate program. If after being removed from probation, the student again receives an unsatisfactory grade (U or below B) in a School of Engineering course, he or she will return immediately to academic probation.

Graduate students experiencing circumstances or difficulties that impact their academic performance should contact their advisor and the graduate director immediately. Students may appeal their dismissal.

Applying for Graduation

Students planning to graduate should refer to the Baskin School of Engineering Graduate Studies website.

SERIOUS GAMES M.S.

Introduction

The M.S. in serious games prepares next generation designers and developers for games and interactive experiences that have a purpose other than entertainment, such as experiences that can serve as applications for education, informal learning, health or training. We expect students coming into this degree to be highly motivated to make social impact by designing

experiences targeting different markets, such as EdTech, health and wellbeing, personal enrichment, fitness, and medicine. The degree is offered through the UC Santa Cruz location in Silicon Valley to enable students to connect and collaborate with the local industry in the markets mentioned above.

The curriculum covers four core competencies: (1) game design and development, which includes working in a group to design, develop software experiences, elicit user input and test the user experience (similar to its “sister” degree games and playable media also offered in Silicon Valley Campus); (2) fundamental knowledge of working with experts in an application area to develop and measure a targeted impact; (3) statistical analysis, modeling and simulation; and (4) conducting efficacy measurements and developing summative evaluation measures.

The M.S. in serious games is a five-quarter program that begins in fall quarter, includes career planning courses and activities, and encourages student internships during summer. Students are expected to complete coursework in five academic quarters, without leaves of absence.

Requirements

Course Requirements

Students are required to complete at least 50 credits for the M.S., and more credits are recommended for students without full preparation before beginning the degree, as discussed in the “Planners” section, below. The required courses are as follows:

All of the following courses:

GAME 200	Game Design Systems	5
GAME 221	Professional Development for Game Makers	5
GAME 250	Foundations of Serious Games	5
GAME 255	Serious Games Studio I	5
GAME 256	Serious Games Studio II	5
GAME 257	Serious Games Studio III	5
GAME 280A	Games Proseminar	2

GAME 280A must be taken a minimum of two times.

Plus one of the following options:

Either this course		
GAME 230	Fundamentals of Game Engineering	5
or these courses		
GAME 235	Game Development I	5
GAME 236	Game Development II	5

Students who lack sufficient technical preparation to enroll in GAME 230, Fundamentals of Game Engineering, must take both GAME 235, Game Development I, and GAME 236, Game Development II. Assessment of technical preparation will be performed

based on completed coursework prior to entry into the program, discussion with the student, and, at the program's discretion, use of a technical assessment examination.

Three courses from the elective list below

Students are required to take a minimum of three electives. These electives may be of two types: computational media electives and subject matter electives. Students are expected to take at least one computational media elective.

Computational media electives are offered at the Silicon Valley or Santa Cruz campus of UC Santa Cruz and focus on games, or related forms of computational media, or related topics in computing and culture. The current offerings in this category are listed below. Subject matter electives are taken to deepen a student's understanding of the specific subject matter on which they may develop a game, or may already be developing a game. These may be drawn from across the graduate and upper-division undergraduate curriculum at UC Santa Cruz, given that the potential subject areas for serious games are vast.

CMPM 235	User Evaluation of Technology	5
CMPM 244	Artificial Intelligence in Games	5
CMPM 248	Interactive Storytelling	5
CMPM 265	Generative Methods	5
CMPM 290J	Playable Media	5
CMPM 297	Independent Study	
CSE 201	Analysis of Algorithms	5
CSE 210A	Programming Languages	5
DANM 201	Recent Methods and Approaches to Digital Arts and Culture	5
DANM 202	Dialogues and Questions in Digital Arts and Culture	5
DANM 219	Introduction to Electronics for Artmaking	5
DANM 241B	Modern Art: Cubism to Pop	5
DANM 250E	Collaborative Research Project Group: Experimental Play	5
DANM 254I	Empirical Approaches to Art Information	5
DANM 281	Special Topics in Digital Arts and New Media	5
GAME 201	Level Design	5
GAME 202	Foundations of Alternative Controller Games	5
GAME 210	Game Art Intensive	5
GAME 215	Audio Direction	5
GAME 231	Game Technologies	5
GAME 232	Advanced Game Technologies	5
GAME 238	Computer Graphics for Games	5
GAME 240	Game Usability	5
GAME 251	Games User Research	5
GAME 252	Modeling and Simulation	5

GAME 290A	Advanced Topics in Games	5
MUSC 206B	Computer-Assisted Composition	5

Credit for different CMPM 297 options vary. A maximum of five credits of CMPM 297 (Independent Study or Research) can be used to meet degree requirements.

Master's Capstone Project

Completion of two master's capstone projects are required for the master's degree targeting two different Serious Games markets, and thus enabling students a diverse portfolio targeting different markets and application areas. These projects are usually done in collaboration with other students and involve a design process of ideation, user experience inquiry and design, rapid prototyping and development given a stakeholder, usually a subject matter expert who defines the project goal, desired impact and outcomes. The two capstone projects are completed through interdisciplinary teamwork working closely with a stakeholder, which is also how the professional field is organized. Students are evaluated based both on their individual contributions to the project and on the overall success of the project as a whole given the stakeholders' goals, desired impacts and outcomes. Each project will be demonstrated via a public presentation, and this demonstration constitutes part of the final project evaluation.

Evaluation of projects is performed by a committee consisting of at least three people, comprised of at least the Serious Games vice chair, a Computational Media Faculty member, and an outside member, who can be a faculty member, an industry practitioner, or other members of the program advisory boards, or other instructors in the programs. A majority of the committee's voting members are members of the UC Santa Cruz academic senate.

Planners

There are two primary paths through the first year of the degree. Students with less technical background take GAME 235, GAME 236, and GAME 231 in their first year, while those with more technical background take GAME 230 and GAME 231 in their first year.

The sample programs include summer internships or sponsored projects. These are not required, and do not bear academic credit. They are, however, strongly suggested.

Sample program for students with more technical background

Fall Quarter 1	GAME 230, Fundamentals of Game Engineering (5 credits)
	GAME 200, Game Design Systems (5 credits)

Winter Quarter 2	GAME 250, Foundations of Serious Games (5 credits) Elective 1 (5 credits) GAME 280A, Games Proseminar (2 credits)
Spring Quarter 3	GAME 255, Serious Games Studio I (5 credits) Elective 2 (5 credits) GAME 221, Professional Development for Game Makers I (5 credits)
Summer	Internship or Sponsored Project
Fall Quarter 4	GAME 256, Serious Games Studio II (5 credits) Elective 3 (5 credits)
Winter Quarter 5	GAME 257, Serious Games Studio III (5 credits) GAME 280A, Games Proseminar (2 credits)

Sample program for students with less technical background

Fall Quarter 1	GAME 235, Game Development I (5 credits) GAME 200, Game Design Systems (5 credits)
Winter Quarter 2	GAME 236, Game Development II (5 credits) GAME 250, Foundations of Serious Games (5 credits) GAME 280A, Games Proseminar (2 credits)
Spring Quarter 3	GAME 255, Serious Games Studio I (5 credits) Elective 1 (5 credits) GAME 221, Professional Development for Game Makers I (5 credits)
Summer	Internship or Sponsored Project
Fall Quarter 4	GAME 256, Serious Games Studio II (5 credits) Elective 2 (5 credits)
Winter Quarter 5	GAME 257, Serious Games Studio III (5 credits) Elective 3 (5 credits)

GAME 280A, Games Proseminar (2 credits)

Transfer Credit

Up to three School of Engineering courses fulfilling the degree requirements of the M.S. degree may be taken before beginning the graduate program through the concurrent enrollment program. The elective requirement of the M.S. program may also be satisfied through courses from other institutions or prior UCSC coursework. Petitions should be submitted along with the transcript from the other institution. For courses taken at other institutions, copies of the syllabi, examinations, and other coursework should accompany the petition. Such petitions are not considered until the completion of at least one quarter at UCSC.

At most, a total of three courses may be transferred from concurrent enrollment and other institutions.

Review of Progress

On an ongoing basis, the faculty reviews the progress of every student. Students not making adequate progress toward completion of degree requirements (see the Graduate Handbook for policy on satisfactory academic progress) are subject to dismissal from the program. Students with academic deficiencies may be required to take additional courses. Full-time students with no academic deficiencies are normally expected to complete the degree requirements at the rate of at least two five-credit courses per quarter, and move forward through the course sequences together with their cohort, remaining on track to complete the degree in five academic quarters.

Students receiving two or more unsatisfactory grades (U or grade below B) in the School of Engineering (SoE) courses, or who receive an unsatisfactory grade (U or grade below B) in a course in the Serious Games Studio sequence, are not making adequate progress and will be placed on academic probation for the following quarter of registered enrollment. Withdrawing or taking a leave of absence does not count as enrollment. Part-time enrollment is counted as a half quarter of enrollment. Students who are on academic probation or are not enrolled full time are no longer guaranteed any previously committed funding. Should students receive an unsatisfactory grade (U or below B) in a School of Engineering course while on probation, the Computational Media Department may request the graduate dean to dismiss that student from the graduate program. If after being removed from probation, the student again receives an unsatisfactory grade (U or below B) in a School of Engineering course, he or she will return immediately to academic probation.

Graduate students experiencing circumstances or difficulties that impact their academic performance should contact their adviser and the graduate director immediately. Students may appeal their dismissal.

Applying for Graduation

Students planning to graduate should refer to the Baskin School of Engineering Graduate Studies website.

Computer Science and Engineering

Baskin School of Engineering
(831) 459-2158
<http://www.soe.ucsc.edu>

PROGRAMS OFFERED

Computer Engineering B.S. (p. 473)

Computer Science B.S. (p. 479)

Computer Science B.A. (p. 484)

Network and Digital Technology B.A. (p. 489)

Computer Engineering Minor (p. 494)

Computer Science Minor (p. 494)

Computer Science and Engineering Bachelor's/Master's
Contiguous Pathway

Computer Science and Engineering M.S. (p. 496)

Natural Language Processing M.S. (p. 502)

Computer Science and Engineering Ph.D. (p. 499)

Human Language Media and Modeling Designated
Emphasis (p. 504)

OTHER PROGRAMS OF INTEREST

Computer Science: Computer Game Design B.S. (p. 448)

Robotics Engineering B.S. (p. 514)

Technology and Information Management B.S. (p. 540)

Technology and Information Management Minor (p. 545)

Computer scientists and engineers study the design and architecture of digital systems, their properties, and their application. The science and engineering of computing systems includes a variety of disciplines from the mathematical study of computation to the design of architectures leveraging advanced technologies, as well as expertise in the many different levels of abstraction in between, and the realization of a vast array of applications and information technologies. These systems are now present in almost every human endeavor, in the form of embedded systems to cloud-scale computation, from personal devices to society-scale networks and systems, from data science to the everyday systems they automate.

Computing is the field that is most strongly influencing the societal, industrial, and technological advances of this century, bringing a revolution spanning from what

humans can do (via information technology, data science, e-commerce, and more) to how they communicate (the web, social networks, mobile devices, and virtual/augmented reality). Indeed, as of April 2021, three of the four largest companies worldwide by market capitalization are all information technology companies. The rapid and targeted communication afforded by these systems has affected our culture and politics. Computing, from hardware to algorithms and networking, is responsible for an increasing share of the value even of products that once were purely mechanical systems, such as automobiles.

Computing spans multiple areas that are continually evolving, spurred by both technological and theoretical advances; the current areas can be roughly categorized as follows:

- Design and architecture, or how computing systems are built: from VLSI/CAD, to architectures and parallel systems.
- Systems, or how the architectures can be organized: operating systems, storage, networking, and databases, the languages used to program them, and the techniques used to ensure their secure operation.
- Theory, concerning the abstract properties of computing systems, spanning from the theory of computation to algorithms, from the foundations of programming languages and concurrency to the theory of databases and distributed systems.
- Data science, or how to computationally understand information about the world, including artificial intelligence and machine learning, natural language processing and vision.
- Applications, or how computing systems can be used and what the implications of their use are, from web to mobile systems, from vision to assistive technologies, from fairness and privacy issues to the societal implications of computing, to the incentive structures that make collaboration and communication possible.

Computing at UC Santa Cruz has already attained a very high level of international recognition. The Computer Science and Engineering Department's organization, as a single cohesive department, facilitates new projects and courses that span multiple areas. As a broad department, it benefits from a wider and more prepared graduate student cohort, and the close coordination of degrees with course offerings that provide engineering majors with more streamlined and cutting-edge degree programs. With its proximity to Silicon Valley and its outstanding research, UCSC is a leader in computing research and education.

The Computer Science and Engineering Department offers five undergraduate degree programs, three undergraduate minors, and graduate master's and doctoral degree programs.

Two additional programs in the Baskin School of Engineering share the same introductory programming courses as the Computer Science and Engineering Department's computing majors. The Computational Media Department offers a degree that focuses on computer game design by providing students with artistic, systems, and management perspectives for developing computer games. The Electrical and Computer Engineering Department offers a degree in robotics that builds on courses in computer engineering and electrical engineering, combined with mechanical engineering, that focuses on constructing and controlling robotic devices.

UNDERGRADUATE PROGRAM

The Computer Science and Engineering Department at UC Santa Cruz offers five undergraduate degrees and three related minors:

The **bachelor of science (B.S.) in computer engineering** prepares graduates for a rewarding career in engineering. UCSC computer engineering graduates will gain a thorough grounding in the principles and practices of computer engineering and the scientific and mathematical principles upon which they are built; they will be prepared for further education (both formal and informal) and for productive employment in industry. Because computer engineering is so broad, the B.S. in computer engineering offers four specialized concentrations for completing the program: systems programming, computer systems, networks, and digital hardware.

The **bachelor of science (B.S.) in computer science** is appropriate for students desiring a strong concentration in the core areas of computer science—algorithms, programming languages, and systems—with more courses in computer science, computer engineering, and computational media; this program also allows for a few electives outside of science and engineering.

The **bachelor of arts (B.A.) in computer science** is designed to give students a solid grounding in both theoretical and practical topics in computer science, computer engineering, and mathematics while leaving flexibility for a broad program of study, including some courses outside of science and engineering, or even for a double major in another discipline.

The **bachelor of arts (B.A.) in network and digital technology** provides students with in-depth knowledge of the underlying structure and function of network and computer technology and the design processes that make those technologies function. The program is tailored to students who wish to combine technology with other fields or have a general focus on digital design or computer networks. The B.A. in network and digital technology is not an engineering degree, but B.A. graduates will be prepared to work with technology development in other capacities, or join the computer network workforce.

At UC Santa Cruz, students in computing majors are first **introduced to programming** using the Python

programming language in CSE 20, Beginning Programming in Python. The core programming sequence, courses CSE 13S, Computer Systems and C Programming, (or CSE 13E Embedded Systems and C Programming), and CSE 30, Programming Abstractions: Python, expose students to more advanced concepts in C and Python. CSE 12, Computer Systems and Assembly Language & Laboratory, is taken prior to CSE 13S or CSE 13E to provide the underpinnings of computer organization necessary for mastering the C programming language. Students with a prior programming course, AP credit, or clearing the "Test-out" bar will start with CSE 30 and CSE 12. Note that CSE 30 assumes some Python experience, students trained in a different language should self-study Python to prepare for CSE 30. See the CSE 20 Testout Exam website for resources and further information.

Many computer engineering and computer science students continue their education through the M.S. degree. The Department of Computer Science and Engineering offers a **combined B.S./M.S. pathway** in computer science and engineering that enables eligible undergraduates to move without interruption to the graduate program. Interested students should contact their adviser for more details.

COURSES FOR NON-MAJORS

The Department of Computer Science and Engineering offers course CSE 3, Personal Computer Concepts: Software and Hardware, providing students an introductory course on the design and use of computers from an engineering viewpoint. Other courses of interest to non-majors include CSE 20, Beginning Programming in Python and CSE 12, Computing Systems and Assembly Language & Laboratory an introductory course on computer systems, system software, and machine-level programming; CSE 80N, Introduction to Networking and the Internet, an introduction to technological services of the Internet; and CSE 80A, Universal Access: Disability, Technology, and Society.

GRADUATE PROGRAM

The Department of Computer Science and Engineering offers a doctorate (Ph.D.) and a master of science (M.S.) degree program. Graduate students in these programs establish a solid foundation in algorithms, architectures, programming languages, and then proceed to a thorough study of recent developments in their selected area of specialization. The department offers the M.S. in the Natural Language Processing professional degree program.

The normative time for the CSE Ph.D. program is five years for a full-time student.

Students admitted to the CSE Ph.D. program are generally supported in the form of a combination of fellowships, teaching assistantships, and/or graduate research assistantships.

The normative time for CSE M.S. thesis track programs is two years for a full-time student and from one year to four quarters for the M.S. project track programs.

The CSE M.S. thesis track is for students interested in advanced studies and carrying out independent research as well as those contemplating pursuit of a Ph.D. degree.

The M.S. in Natural Language Processing program is a full yearlong program (fall through summer) offered through the UCSC campus location in Silicon Valley.

COMPUTER ENGINEERING B.S.

Information and Policies

Introduction

The following concentrations are specializations for the computer engineering student. Students must complete all of the courses listed within their selected concentration. The four concentrations differ by only five specialized courses; the remaining courses are the same.

Systems Programming Concentration

The systems programming concentration focuses on software systems: courses include operating systems, compilers, software engineering, and advanced programming. Students finishing this concentration are very well prepared for building large software systems of all types. This concentration is the closest one to a computer science major—the main differences are that it does not require computer science theory courses, but because of the core computer engineering requirements, includes more hardware and electronics than a computer science bachelor's degree.

Computer Systems Concentration

The computer systems concentration provides a balance between software and hardware design. Students are prepared for a large variety of different design tasks, especially those requiring the integration of hardware and software systems, but may need further training for any particular specialization.

Networks Concentration

The networks concentration focuses on communication between computers, covering both network hardware and protocols. Students finishing this concentration are well prepared for the design of wired and wireless network systems.

Digital Hardware Concentration

The digital hardware concentration focuses on hardware design and includes more electronics than the other concentrations. Students finishing this concentration are well prepared for building hardware systems. This concentration is the closest one to an electronics major; the main differences are that it does not require as much electronics theory or analog electronic design, but

because of the core computer engineering requirements, requires more software skills.

Academic Advising for the Program

The Baskin School of Engineering undergraduate advising office offers general advising for prospective and declared undergraduates majoring in School of Engineering programs. The office handles major declarations, transfer credits, course substitutions, articulations, and degree certifications. Undergraduate students obtain and submit all paperwork requiring departmental approval to the undergraduate advising office. Transfer students should also refer to the Transfer Information and Policy section.

Baskin Engineering Building, Room 225
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Getting Started in the Major

Program Learning Outcomes

For the Computer Engineering B.S. degree, the program learning outcomes are:

- an ability to apply knowledge of mathematics, science, and engineering;
- an ability to design a system, component, or process to meet desired needs within realistic constraints;
- an ability to function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty;
- an ability to communicate effectively; and
- an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Major Qualification Policy and Declaration Process

Major Qualification

In order to declare the computer engineering major students must be listed as a proposed major within the School of Engineering. Please refer to the School of Engineering's "Proposed Major Retention" and its "Declaring a School of Engineering Major" sections in the catalog for more information.

To qualify for the computer engineering major students must have completed at least 36 credits in the CE Major Qualification Courses listed below and satisfy the following:

1. their combined GPA is at least 2.8 in all of the CE Major Qualification Courses attempted; and

2. they have no more than 7 credits resulting in grades of C-, D+, D, D-, F or NP among all of the CE Major Qualification Courses attempted.

CE Major Qualification Courses

All of the following:

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

Plus one of the following

AM 30	Multivariate Calculus for Engineers	5
MATH 23A	Vector Calculus	5

Whichever is completed first

Plus one of the following

AM 10	Mathematical Methods for Engineers I	5
MATH 21	Linear Algebra	5

Whichever is completed first

Plus all of the following

AM 20	Mathematical Methods for Engineers II	5
CSE 12	Computer Systems and Assembly Language	5

Plus one of the following

CSE 13S	Computer Systems and C Programming	7
ECE 13	Computer Systems and C Programming	7

Plus all of the following

CSE 16	Applied Discrete Mathematics	5
CSE 30	Programming Abstractions: Python	7
PHYS 5A	Introduction to Physics I	5
PHYS 5L	Introduction to Physics I Laboratory	1
PHYS 5C	Introduction to Physics III	5
PHYS 5N	Introduction to Physics Laboratory III	1

Appeal Process

Students who are informed that they are not qualified for the major may appeal this decision by submitting a letter to the undergraduate director through the Baskin School of Engineering undergraduate advising office within 15 days from the date the notification was mailed. Within 15 days of receipt of the appeal, the department will notify the student, college, and Office of the Registrar of the decision.

How to Declare a Major

There are four steps to declaring a BSOE major. For a detailed guide to this process, please consult Baskin Engineering's Declare Your Major website.

Students should start the declaration of major process by completing Step One on the BSOE Declare Your Major website as soon as they complete 36 credits in the CE major qualification courses or reach their declaration deadline quarter, whichever comes first.

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed enough courses.

Transfer Information and Policy

Transfer Admission Screening Policy

Students should complete at least six of the following

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
AM 10	Mathematical Methods for Engineers I	5
MATH 21	Linear Algebra	5
AM 20	Mathematical Methods for Engineers II	5
AM 30	Multivariate Calculus for Engineers	5
MATH 23A	Vector Calculus	5
CSE 12	Computer Systems and Assembly Language	5
CSE 13S	Computer Systems and C Programming	7
CSE 16	Applied Discrete Mathematics	5
CSE 30	Programming Abstractions: Python	7
ECE 13	Computer Systems and C Programming	7
PHYS 5A	Introduction to Physics I	5
PHYS 5L	Introduction to Physics I Laboratory	1
PHYS 5C	Introduction to Physics III	5
PHYS 5N	Introduction to Physics Laboratory III	1

Lecture/lab combinations count as one course.

CSE 13S and ECE 13 are alternatives; only one or the other, whichever is completed first, can count toward the six courses.

AM 30 and MATH 23A are alternatives; only one or the other, whichever is completed first, can count toward the six courses.

AM 10 and MATH 21 are alternatives; only one or the other, whichever is completed first, can count toward the six courses.

Cumulative GPA

Their cumulative GPA should be at least 2.8 in all of the courses attempted.

Transfer students who wish to graduate in two years are strongly recommended to complete all lower division major requirements and most General Education requirements before coming to UC Santa Cruz.

Getting Started at UCSC as a Transfer Student

Transfer students should declare their major in their first quarter at UC Santa Cruz. Instructions for declaring a major in the Baskin School of Engineering are on the department's website.

Letter Grade Policy

All students admitted to a School of Engineering major, or seeking admission to a major, must take all courses required for that major for a letter grade. This policy includes courses required for these degrees that are sponsored by other departments.

[Optional Catchall]

Course Substitution Policy

Undergraduate engineering students who wish to substitute a major course with a course from another department at UC Santa Cruz, or from another academic institution, must first seek approval through the School of Engineering Undergraduate Advising Office. The advising office requires a Petition for Course Substitution be approved before credit for an alternate course can be applied to any School of Engineering major requirement.

Petition forms are available at the undergraduate advising office and on the Undergraduate Affairs website.

Petitions and procedures for approval must be obtained from and submitted to the Undergraduate Advising Office.

Double Majors and Major/Minor Combinations Policy

Students completing the computer engineering major cannot also receive the computer engineering minor or the Network and Digital Technology B.A. degree.

Study Abroad

Honors

Majors are considered for "Honors in the Major" and "Highest Honors in the Major" based on their GPA and

on results of undergraduate research and other significant contributions to the School of Engineering. Students with a GPA of 3.70, in most cases, receive highest honors. Students with a GPA of 3.30, in most cases, receive honors. Students with particularly significant accomplishments in undergraduate research or contributions to the School of Engineering may be considered with a lower GPA. Computer engineering juniors and seniors may also be eligible for election to the UC Santa Cruz chapter of Tau Beta Pi, the national engineering honor society founded in 1885.

Materials Fee and Miscellaneous Fees

Please see the section on fees under the School of Engineering.

Requirements and Planners

Course Requirements (all concentrations)

All students in the computer engineering major take the same core courses, which give the fundamentals of programming and hardware design, supported by the physics and mathematics necessary to understand them. Students must complete all of the courses listed within their selected concentration, and they must complete the capstone sequence. The comprehensive requirement for computer engineering majors is satisfied by completion of the capstone course and the exit requirement.

Lower-Division Courses

All of the following

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

Plus one of the following

AM 30	Multivariate Calculus for Engineers	5
MATH 23A	Vector Calculus	5

Plus one of the following

AM 10	Mathematical Methods for Engineers I	5
MATH 21	Linear Algebra	5

Plus all of the following

AM 20	Mathematical Methods for Engineers II	5
CSE 12	Computer Systems and Assembly Language	5

Plus one of the following

CSE 13S	Computer Systems and C Programming	7
ECE 13	Computer Systems and C Programming	7

Plus all of the following

CSE 16	Applied Discrete Mathematics	5
CSE 20	Beginning Programming in Python	5
CSE 30	Programming Abstractions: Python	7
PHYS 5A	Introduction to Physics I	5
PHYS 5L	Introduction to Physics I Laboratory	1
PHYS 5C	Introduction to Physics III	5
PHYS 5N	Introduction to Physics Laboratory III	1

Students with no prior programming will take CSE 20 before CSE 30 and CSE 12. Students with a prior programming course, AP credit, or clearing the “Test-out” bar will start with CSE 30, and CSE 12.

Plus one of the following options

Either these courses		
PHYS 5B	Introduction to Physics II	5
PHYS 5M	Introduction to Physics II Laboratory	1
or this course		
ECE 9	Statics and Mechanics of Materials	5

Upper-Division Courses

Core requirements:

(In addition to the core requirements students must complete the courses for one of the concentrations.)

CSE 100	Logic Design	5
CSE 100L	Logic Design Laboratory	2
CSE 101	Introduction to Data Structures and Algorithms	5
CSE 107	Probability and Statistics for Engineers	5
CSE 120	Computer Architecture	5
CSE 121	Microprocessor System Design	5
CSE 185E/CSE 101	Technical Writing for Computer Science and Engineering	5
ECE 101	Introduction to Electronic Circuits	5
ECE 101L	Introduction to Electronic Circuits Laboratory	2
ECE 103	Signals and Systems	5
ECE 103L	Signals and Systems Laboratory	2

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement in computer engineering is satisfied by one of the following:

CSE 185E/CSE 101	Technical Writing for Computer Science and Engineering	5
CSE 195	Senior Thesis Research	5

Comprehensive Requirement**Capstone Requirement**

All computer engineering students complete one of the following capstone sequences:

Both of the following courses

CSE 123A	Engineering Design Project I	5
CSE 123B	Engineering Design Project II	7

Or all of the following courses

CSE 129A	Capstone Project I	2
CSE 129B	Capstone Project II	5
CSE 129C	Capstone Project III	5

Or the following course

CSE 195	Senior Thesis Research	5
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CSE 195 also requires the submission of an approved senior thesis.

Or all of the following courses

CSE 115A	Introduction to Software Engineering	5
CSE 115B	Software Design Project	5
CSE 115C	Software Design Project II	5

Or the following course

ECE 118	Introduction to Mechatronics	10
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May not also be used as a concentration elective.

Or both of the following courses

CSE 115A	Introduction to Software Engineering	5
CSE 115D	Software Design Project - Accelerated	5

Or the following course

CSE 157	Internet of Things	7
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May not also be used as a concentration elective.

Exit Requirement

Students are required to complete an exit survey and attend an exit interview. Portfolios of the student's work will be collected from our courses for program evaluation. The portfolios will be reviewed by the computer engineering undergraduate committee and will include two project reports: CSE 121 and either the senior capstone report (CSE 115C, or CSE 115D, or CSE 129A and CSE 129B and CSE 129C, or CSE 123A and CSE 123B, or ECE 118, or CSE 157) or the student's senior thesis.

Concentration Courses

All students in the computer engineering major take the same core courses, which give the fundamentals of programming and hardware design, supported by the physics and mathematics necessary to understand them. Students must complete all of the courses listed within their selected concentration, and they must complete the capstone sequence. The comprehensive requirement for computer engineering majors is satisfied by completion of the capstone course and the exit requirement.

Computer Systems Concentration Requirements**One of the following courses**

CSE 125	Logic Design with Verilog	5
CSE 122	Introduction to VLSI Digital System Design	5

CSE 222A, Advanced VLSI Digital System Design, may be substituted for CSE 122 with department approval.

Plus the following course

CSE 130	Principles of Computer Systems Design	5
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Plus one of the following courses

CSE 111	Advanced Programming	5
CSE 115A	Introduction to Software Engineering	5
CSE 134	Embedded Operating Systems	5

Plus one upper-division or graduate elective

From the approved elective list (p. 506) or the department's approved list of electives for the computer engineering major

Digital Hardware Concentration Requirements**The following course**

CSE 125	Logic Design with Verilog	5
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Plus one of the following options

Either these courses

ECE 171	Analog Electronics	5
ECE 171L	Analog Electronics Laboratory	2

or this course

CSE 122	Introduction to VLSI Digital System Design	5
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CSE 222A, Advanced VLSI Digital System Design, may be substituted for CSE 122 with department approval.

Plus one of the following courses

CSE 122	Introduction to VLSI Digital System Design	5
CSE 220	Computer Architecture	5
ECE 171	Analog Electronics	5

ECE 171L	Analog Electronics Laboratory	2
ECE 173	High-Speed Digital Design	5
ECE 173L	High-Speed Digital Design Laboratory	2

Lecture/lab combinations count as one course.

Note that CSE 122 or ECE 171 and ECE 171L cannot be used again here.

Plus one upper-division or graduate elective

From the approved elective list (p. 507) or the department's approved list of electives for the computer engineering major

Networks Concentration Requirements**All of the following courses**

CSE 150	Introduction to Computer Networks	5
CSE 150L	Introduction to Computer Networks Laboratory	2
CSE 156	Network Programming	5
CSE 156L	Network Programming Laboratory	2
CSE 130	Principles of Computer Systems Design	5

Plus one of the following options

Either the lecture/lab combination of CSE 151 and CSE 151L, or one upper-division or graduate elective from the approved elective list (p. 504) or the department's approved list of electives for the computer engineering major

System Programming Concentration Requirements**The following course**

CSE 130	Principles of Computer Systems Design	5
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Plus one of the following courses

CSE 111	Advanced Programming	5
CSE 115A	Introduction to Software Engineering	5
CSE 134	Embedded Operating Systems	5

Plus both of the following courses

CSE 150	Introduction to Computer Networks	5
CSE 150L	Introduction to Computer Networks Laboratory	2

Plus one of the following options

Either the lecture/lab combination of CSE 151 and CSE 151L, or one upper-division or graduate elective from the approved elective list (p. 506) or the department's approved list of electives for the computer engineering major

Plus one of the following courses

CSE 113	Parallel and Concurrent Programming	5
CSE 156	Network Programming	5
CSE 156L	Network Programming Laboratory	2
CSE 110A	Fundamentals of Compiler Design I	5

CSE 156 and CSE 156L lecture/lab combination count as one course.

Planners

Below are two sample academic plans for students majoring in computer engineering. Since the plans for the third and fourth years will vary according to the concentration and capstone selected, placeholders for these courses have been indicated with “concentration course” and “capstone course.” As part of the major declaration process students prepare a four-year plan based on a concentration and this may affect the placement of other courses as well. Careful planning at the time of declaration is required to complete the degree within four years. Entering frosh who have little programming experience, are strongly advised to take a programming course in the fall quarter. Students completing the courses in the four-year planners will have satisfied the MF, PR-E, SI, and SR general education requirements.

Plan One for Entering Frosh

This plan is for students with programming experience who are prepared for MATH 19A.

	Fall	Winter	Spring
1st (frosh)	MATH 19A	MATH 19B	AM 30
	CSE 12 & CSE 12L	PHYS 5A & PHYS 5L	CSE 30
2nd (soph)	AM 10	AM 20	CSE 120
	PHYS 5C & PHYS 5N	CSE 100 & CSE 100L	CSE 101
	CSE 16		PHYS 5B & PHYS 5M
3rd (junior)	ECE 101 & ECE 101L	CSE 107	CSE 185E
	Concentration course	Concentration course	CSE 121
4th		Capstone	Concentration course
		Capstone	Capstone

(senior)	ECE 103 & ECE 103L	Concentration course	Concentration course
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Plan Two for Entering Frosh

This plan is for students with no programming experience who are placed into MATH 3.

	Fall	Winter	Spring
1st (frosh)	MATH 3	MATH 19A	MATH 19B
	CSE 20	CSE 12 & CSE 12L	CSE 30
2nd (soph)	PHYS 5A & PHYS 5L	PHYS 5C & PHYS 5N	PHYS 5B & PHYS 5M
	CSE 13S	CSE 16	AM 30
	AM 10	AM 20	CSE 101
3rd (junior)	ECE 101 & ECE 101L	CSE 107	CSE 185E
	CSE 120	CSE 100 & CSE 100L	ECE 103 & ECE 103L
4th (senior)	CSE 121	Capstone course	Concentration course
	Concentration course	Concentration course	

Plan for Junior Transfers

Below is a sample academic plan for students transferring to UC Santa Cruz in computer engineering for their junior year. It assumes that all but one lower-division and all general education course requirements have been satisfied. Since the plans for the third and fourth years vary according to the concentration and capstone selected, placeholders for these courses have been indicated with “concentration course” and “capstone course.” As part of the major declaration process students prepare a plan based on a concentration and this may affect the placement of other courses as well. Careful planning at the time of declaration is required to complete the degree within two years.

	Fall	Winter	Spring
3rd (junior)	ECE 101 & ECE	CSE 107	CSE 120

ECE 13	Computer Systems and C Programming	7
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CSE 13S recommended

And these courses

CSE 12	Computer Systems and Assembly Language	5
CSE 30	Programming Abstractions: Python	7

Plus one of the following

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 20A	Honors Calculus	5

Plus one of the following

MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 20B	Honors Calculus	5

Cumulative GPA

Students must also have a cumulative GPA of at least 3.0 in the CS major qualification courses attempted at UC Santa Cruz, with at most one unsuccessful attempt (grade C-, D+, D, D-, F, or NP) permitted in a CS major qualification course.

Appeal Process

Students who are informed that they do not qualify for the major may appeal this decision by submitting a letter to the undergraduate director through the Baskin School of Engineering undergraduate advising office within 15 days from the date the notification was mailed. Within 15 days of receipt of the appeal, the department will notify the student, college, and Office of the Registrar of the decision.

How to Declare a Major

Students interested in pursuing computer science must indicate computer science as a proposed major on their application for admission to UC Santa Cruz. Students admitted to UCSC in fall 2018 or later will be able to declare a computer science major only if they have been admitted to UCSC as proposed computer science majors.

There are four steps to declaring a BSOE major. For a detailed guide to this process, please consult Baskin Engineering's Declare Your Major website.

Students should start the declaration of major process by completing Step One on the BSOE Declare Your Major website as soon as they complete the CS major qualification courses or reach their declaration deadline quarter, whichever comes first.

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of

some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed all CS major qualification courses.

Transfer Information and Policy

Transfer Admission Screening Policy

Prior to admission, transfer students must have completed the following five courses or their articulated equivalents with a combined minimum GPA of 3.0.

Lecture/lab combinations count as one course.

This course

CSE 30	Programming Abstractions: Python	7
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Plus one of the following

CSE 13S	Computer Systems and C Programming	7
ECE 13	Computer Systems and C Programming	7

Plus one of the following options

Either this course		
CSE 12	Computer Systems and Assembly Language	5
or this course		
CSE 16	Applied Discrete Mathematics	5

Plus one of the following

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 20A	Honors Calculus	5

Plus one of the following

MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 20B	Honors Calculus	5

Minimum GPA

The combined GPA in the five courses above must be at least of 3.0. A student lacking one of these five courses may be admitted if they have completed CSE 16, and CSE 12, or the articulated alternative.

Furthermore, transfer students entering in the fall must have completed at least three of these courses by the end of the fall term of the previous academic year and have a minimum 3.0 GPA over all completed CS major qualification courses at that time.

Transfer students are strongly recommended to complete CSE 16 as part of their screening courses, and to complete one course out of MATH 21, AM 10, MATH 23A or AM 30, and most general education requirements prior to arriving at UC Santa Cruz.

Transfer students admitted for the winter term must satisfy the major preparation criteria for transfer students admitted for the fall term and, additionally, must have successfully completed at least two additional courses that are required for the proposed degree, prior to admission. It is highly recommended that these courses should be AM 10 (or MATH 21) and AM 30 (or MATH 23A).

Most courses in the computer science program at UC Santa Cruz have a strong theoretical component to prepare the student for designing, as opposed to simply using, computer systems. Often, courses taken at other institutions which emphasize applications of current languages and computers do not count toward the computer science major at UCSC.

At UCSC, computer science students are first introduced to programming using the programming language Python. The core programming sequence—courses CSE 30 and CSE 13S (or ECE 13)—exposes students to both Python and C. Many upper-division courses that involve programming use the C and C++ programming languages.

Transfer students who are not familiar with both an object-oriented language and C may need to take a remedial course. Students familiar with C++ and Unix should find the transition to Python and C relatively simple.

Getting Started at UCSC as a Transfer Student

Transfer students should declare their major in their first quarter at UCSC. Instructions for declaring a major in the Baskin School of Engineering are on the department's major declaration page.

Letter Grade Policy

All students admitted to a School of Engineering major, or seeking admission to a major, must take all courses required for that major for a letter grade. This policy includes courses required for these degrees that are sponsored by other departments.

[Optional Catchall]

Course Substitution Policy

Undergraduate engineering students who wish to substitute a major course with a course from another department at UC Santa Cruz, or from another academic institution, must first seek approval through the School of Engineering Undergraduate Advising Office. The advising office requires a Petition for Course Substitution be approved before credit for an alternate course can be applied to any School of Engineering major requirement.

Petition forms are available at the Undergraduate Advising Office and online.

Petitions and procedures for approval must be obtained from and submitted to the Undergraduate Advising Office.

Double Majors and Major/Minor Combinations Policy

Students may not receive both the computer science B.A. and computer science B.S. degrees.

Study Abroad

Honors

Students must obtain a GPA of 3.8 or higher in the courses in the major to be considered for the distinction of "Highest Honors in the Major." Students must obtain a GPA of 3.5 or higher in the courses in the major to be considered for the distinction of "Honors in the Major." The School of Engineering reserves the right to withhold honors based on other criteria, such as an incident of academic dishonesty.

[Optional Catchall]

Requirements and Planners

Course Requirements

This program is designed for students who wish to maximize exposure to computer science concepts and methods by taking a large selection of upper-division computer science courses, as well as courses in the sciences and mathematics. A minimum of 20 courses must be completed for the B.S. in computer science.

Lower-Division Courses

Computer Science and Engineering

All of the following

CSE 12	Computer Systems and Assembly Language	5
CSE 16	Applied Discrete Mathematics	5
CSE 20	Beginning Programming in Python	5
CSE 30	Programming Abstractions: Python	7

Students with no prior programming will take CSE 20 before CSE 30, and CSE 12. Students with a prior programming course, AP credit, or clearing the "Test-out" bar will start with CSE 30, and CSE 12.

Plus one of the following courses

CSE 13S	Computer Systems and C Programming	7
ECE 13	Computer Systems and C Programming	7

CSE 13S recommended

Mathematics

Plus one of the following options:

Either these courses

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
or these courses		
MATH 20A	Honors Calculus	5
MATH 20B	Honors Calculus	5

Applied Mathematics**One of these courses**

AM 10	Mathematical Methods for Engineers I	5
MATH 21	Linear Algebra	5

Plus one of these courses

AM 30	Multivariate Calculus for Engineers	5
MATH 23A	Vector Calculus	5

Engineering Science

ECE 30	Engineering Principles of Electronics	5
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Upper-Division Courses**Computer Science and Engineering**

The following courses:

CSE 101	Introduction to Data Structures and Algorithms	5
CSE 102	Introduction to Analysis of Algorithms	5
CSE 103	Computational Models	5
CSE 120	Computer Architecture	5
CSE 130	Principles of Computer Systems Design	5

Plus one of the following

CSE 112	Comparative Programming Languages	5
CSE 116	Introduction to Functional Programming	5

Statistics

One of the following:

STAT 131	Introduction to Probability Theory	5
CSE 107	Probability and Statistics for Engineers	5

Electives

Four courses must be completed from the list below. At least one course must be a computer science and engineering course. At most two courses can be from applied mathematics, statistics or mathematics, of which at most one may be substituted with two physics classes, chosen from the following list of class pairs: PHYS 6A and PHYS 6C, PHYS 6A and PHYS 6B, PHYS 5A and PHYS 5C, PHYS 5A and PHYS 5B. Any laboratories

required or recommended by the Physics Department associated with these classes are not part of the computer science B.S. major requirements.

List of B.S. electives:

- Any CSE course with a number below 170, or between 180 and 189, *except* for the DC courses CSE 115A and CSE 185E/CSE 185S.

- or any course from the following list:

AM 114	Introduction to Dynamical Systems	5
AM 147	Computational Methods and Applications	5
CMPM 120	Game Development Experience	5
CMPM 131	User Experience for Interactive Media	5
CMPM 146	Game AI	5
CMPM 163	Game Graphics and Real-Time Rendering	5
CMPM 164	Game Engines	5
CMPM 164L	Game Engines Lab	2
CMPM 171	Game Design Studio II	7
CMPM 172	Game Design Studio III	7
CSE 195	Senior Thesis Research	5
MATH 110	Introduction to Number Theory	5
MATH 115	Graph Theory	5
MATH 116	Combinatorics	5
MATH 117	Advanced Linear Algebra	5
MATH 118	Advanced Number Theory	5
MATH 134	Cryptography	5
MATH 145	Introductory Chaos Theory	5
MATH 145L	Introductory Chaos Laboratory	1
MATH 148	Numerical Analysis	5
MATH 160	Mathematical Logic I	5
MATH 161	Mathematical Logic II	5
STAT 132	Classical and Bayesian Inference	5

Lecture/lab combinations count as one course.

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement.

The DC requirement in computer science B.S. is satisfied by completing an additional course from the following options.

Either one of these courses

CSE 115A	Introduction to Software Engineering	5
CSE 185E/CSE 101	Technical Writing for Computer Science and Engineering	5
CSE 195	Senior Thesis Research	5

Course CSE 195 may be used either as an elective, or to satisfy the DC requirement, but not for both.

Comprehensive Requirement

In addition to the above requirements, students must satisfy one of the following two exit requirements: pass one of the capstone courses (see Capstone Courses below); or successfully complete a senior thesis. A passed capstone course also counts toward satisfying the minimum number of upper-division electives requirement.

Capstone Courses

Students may choose from one of the following capstone courses to satisfy their exit requirement (lecture/lab combinations count as one course):

CSE 110B	Fundamentals of Compiler Design II	5
CSE 115C	Software Design Project II	5
CSE 115D	Software Design Project - Accelerated	5
CSE 121	Microprocessor System Design	5
CSE 121L	Microprocessor System Design Laboratory	2
CSE 134	Embedded Operating Systems	5
CSE 138	Distributed Systems	5
CSE 140	Artificial Intelligence	5
CSE 143	Introduction to Natural Language Processing	5
CSE 144	Applied Machine Learning	5
CSE 156	Network Programming	5
CSE 156L	Network Programming Laboratory	2
CSE 157	Internet of Things	7
CSE 160	Introduction to Computer Graphics	5
CSE 160L	Introduction to Computer Graphics Laboratory	2
CSE 161	Introduction to Data Visualization	5
CSE 161L	Data Visualization Laboratory	2
CSE 162	Advanced Computer Graphics and Animation	5
CSE 162L	Advanced Computer Graphics and Animation Laboratory	2
CSE 163	Data Programming for Visualization	5
CSE 168	Introduction to Augmented Reality and Virtual Reality	7
CSE 181	Database Systems II	5
CSE 183	Web Applications	5
CSE 184	Data Wrangling and Web Scraping	5
CMPM 172	Game Design Studio III	7
ECE 118	Introduction to Mechatronics	10

Senior Thesis

The senior thesis consists of a self-contained project within the broad scope of computer science, but one that is not available in the regular course offerings. A student wishing to complete a senior thesis must successfully complete a minimum of 5 credits in CSE 195, Senior Thesis Research. The supervision of a senior thesis student is always at the discretion of the faculty member.

The student first submits a written thesis proposal and obtains approval of a faculty sponsor. Then the student submits a written draft and makes an oral presentation to a faculty examining committee. After receiving feedback from the examining committee, the student submits one or more additional drafts, until the final draft is approved by the examining committee. The total amount of writing shall be consistent with the campus Disciplinary Communication requirement. A passing grade in CSE 195 is earned when the final thesis is approved.

CSE 195	Senior Thesis Research	5
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Planners

The following are three sample academic plans: (1) a four-year plan for the B.S. major for first-year students with programming experience; (2) an alternative first-year plan for students without programming experience; and (3) a two-year plan for the B.A. major for transfer students that have completed all general education requirements.

Students completing the courses in the planners will have satisfied the MF and SR general education requirement.

Four-Year Plan for Students with Programming Experience

	Fall	Winter	Spring
1st (freshman)	CSE 30	CSE 12	CSE 16
	MATH 19A	MATH 19B	AM 10
2nd (sophomore)	CSE 13S	CSE 101	CSE 120
	AM 30	ECE 30	CSE 107
3rd (junior)	CSE 130	CSE 102	CSE 103
	Elective	Elective	
4th (senior)	Elective	CSE 116	Capstone elective

DC elective

First-Year Plan for Students Without Programming Experience

	Fall	Winter	Spring
1st (fresh)	CSE 20	CSE 30	CSE 12
	MATH 3	MATH 19A	MATH 19B
2nd (soph)	CSE 13S	AM 30	CSE 101
	AM 10	CSE 16	CSE 107
			ECE 30
3rd (junior)	CSE 102	CSE 103	CSE 120
	Elective	Elective	DC-elective
4th (senior)	CSE 116	CSE 130	Capstone elective
	Elective		

Two-Year Degree Planner for Transfer Students

	Fall	Winter	Spring
1st (junior)	CSE 12	CSE 101	CSE 130
	AM 30	CSE 120	CSE 102
	CSE 185S	CSE 107	
2nd (senior)	CSE 116	Elective	Elective
	Elective	Capstone elective	Elective
	CSE 103		

Note: One elective must be drawn from the DC course list and one from the capstone course list. Also, the above plan assumes having taken one of MATH 21, MATH 23A, or AMS 10 and most general education requirements prior to arriving at UCSC as well as courses equivalent to CSE 16 and CSE 30 and CSE 13S (or CSE 14 & CSE 14L and CSE 15 & CSE 15L).

Curriculum charts for all BSOE majors are available at the department's Major Curriculum Charts page.

COMPUTER SCIENCE B.A.**Information and Policies****Introduction**

The bachelor of arts (B.A.) program at UC Santa Cruz is designed to give students a solid grounding in both theoretical and practical topics in computer science, computer engineering, and mathematics while leaving flexibility for a broad program of study, including some courses outside of science and engineering, or even for a double major in another discipline.

Academic Advising for the Program

The Baskin School of Engineering undergraduate advising office offers general advising for prospective and declared undergraduates majoring in School of Engineering programs. The office handles major declarations, transfer credits, course substitutions, articulations, and degree certifications. Undergraduate students obtain and submit all paperwork requiring departmental approval to the undergraduate advising office. Transfer students should also refer to the Transfer Information and Policy section.

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 bsoeadvising@ucsc.edu
 (831) 459-5840

Getting Started in the Major

It is recommended that high school students intending to apply to the computer science major have completed four years of mathematics (through advanced algebra and trigonometry) and three years of science in high school. Comparable college mathematics and science courses completed at other institutions also serve to properly prepare a student for the computer science major.

Program Learning Outcomes

Recipients of a Bachelor of Science or a Bachelor of Arts degree in Computer Science at UC Santa Cruz are expected to have the following skills and experiences:

1. Demonstrate mastery of computer science in the following core knowledge areas:
 - Algorithms, data structures, and complexity
 - Programming languages
 - Software engineering and development
 - Computer systems
2. Apply system-level perspective by thinking at multiple levels of detail and abstraction and by recognizing the context in which a computer system may function, including its interactions with people and the physical world.

3. Apply problem-solving skills and the knowledge of computer science to solve real problems.
4. Understand how technological advances impact society and the social, legal, ethical and cultural ramifications of computer technology and their usage.
5. Write about and orally communicate technical material about computer science and computer systems, broadly conceived.

Major Qualification Policy and Declaration Process

Major Qualification

For all students, it is necessary to be listed as proposed computer science majors within the School of Engineering before being able to declare the major. Additionally, students must satisfy the following three criteria to qualify for the CS B.A. major:

Declare

Students must declare CS (Computer Science B.S. or Computer Science B.A.) as their major between student's second to sixth quarter.

CS Major Qualification courses

Students must have completed the following CS major qualification courses to qualify for the major:

Either this course

CSE 13S	Computer Systems and C Programming	7
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or this course

ECE 13	Computer Systems and C Programming	7
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CSE 13S recommended

And these courses

CSE 12	Computer Systems and Assembly Language	5
CSE 30	Programming Abstractions: Python	7

Plus one of the following

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 20A	Honors Calculus	5

Plus one of the following

MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 20B	Honors Calculus	5

Cumulative GPA

Students must also have a cumulative GPA of at least 2.80 in the CS major qualification courses attempted at

UC Santa Cruz, with at most one unsuccessful attempt (grade C-, D+, D, D-, F, or NP) permitted in a CS major qualification course.

Appeal Process

Students who are informed that they do not qualify for the major may appeal this decision by submitting a letter to the undergraduate director through the Baskin School of Engineering undergraduate advising office within 15 days from the date the notification was mailed. Within 15 days of receipt of the appeal, the department will notify the student, college, and Office of the Registrar of the decision.

How to Declare a Major

Students interested in pursuing computer science must indicate computer science as a proposed major on their application for admission to UC Santa Cruz. Students admitted to UCSC in fall 2018 or later will be able to declare a computer science major only if they have been admitted to UCSC as proposed computer science majors.

There are four steps to declaring a BSOE major. For a detailed guide to this process, please consult Baskin Engineering's Declare Your Major website.

Students should start the declaration of major process by completing Step One on the BSOE Declare Your Major website as soon as they complete the CS major qualification courses or reach their declaration deadline quarter, whichever comes first.

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed all CS major qualification courses.

Transfer Information and Policy

Transfer Admission Screening Policy

Prior to admission, transfer students must have completed the following five courses or their articulated equivalents with a combined minimum GPA of 2.8.

Lecture/lab combinations count as one course.

This course

CSE 30	Programming Abstractions: Python	7
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Plus one of the following

CSE 13S	Computer Systems and C Programming	7
ECE 13	Computer Systems and C Programming	7

Plus one of the following options

Either this course

CSE 12	Computer Systems and Assembly Language	5
or this course		
CSE 16	Applied Discrete Mathematics	5

Plus one of the following

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 20A	Honors Calculus	5

Plus one of the following

MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 20B	Honors Calculus	5

Minimum GPA

The combined GPA in the five courses above must be at least of 2.8. A student lacking one of these five courses may be admitted if they have completed CSE 16, and CSE 12, or the articulated alternative.

Furthermore, transfer students entering in the fall must have completed at least three of these courses by the end of the fall term of the previous academic year and have a minimum 2.80 GPA over all completed CS major qualification courses at that time.

Transfer students admitted for the winter term must satisfy the major preparation criteria for transfer students admitted for the fall term and, additionally, must have successfully completed at least two additional courses that are required for the proposed degree, prior to admission. It is highly recommended that these courses should be AM 10 (or MATH 21) and AM 30 (or MATH 23A).

Most courses in the computer science program at UC Santa Cruz have a strong theoretical component to prepare the student for designing, as opposed to simply using, computer systems. Often, courses taken at other institutions which emphasize applications of current languages and computers do not count toward the computer science major at UCSC.

At UCSC, computer science students are first introduced to programming using the programming language Python. The core programming sequence—courses CSE 30 and CSE 13S (or ECE 13)—exposes students to both Python and C. Many upper-division courses that involve programming use the C and C++ programming languages.

Transfer students who are not familiar with both Python and C may need to take a remedial course. Students familiar with C++ and Unix should find the transition to Python and C relatively simple.

Getting Started at UCSC as a Transfer Student

Transfer students should declare their major in their first quarter at UCSC. Instructions for declaring a major in the Baskin School of Engineering are on the department's major declaration page.

Letter Grade Policy

All students admitted to a School of Engineering major, or seeking admission to a major, must take all courses required for that major for a letter grade. This policy includes courses required for these degrees that are sponsored by other departments.

[Optional Catchall]**Course Substitution Policy**

Undergraduate engineering students who wish to substitute a major course with a course from another department at UC Santa Cruz, or from another academic institution, must first seek approval through the School of Engineering Undergraduate Advising Office. The advising office requires a Petition for Course Substitution be approved before credit for an alternate course can be applied to any School of Engineering major requirement.

Petition forms are available at the Undergraduate Advising Office and online.

Petitions and procedures for approval must be obtained from and submitted to the Undergraduate Advising Office.

Double Majors and Major/Minor Combinations Policy

Students may not receive both the computer science B.A. and computer science B.S. degrees.

Study Abroad**Honors**

Students must obtain a GPA of 3.8 or higher in the courses in the major to be considered for the distinction of "Highest Honors in the Major." Students must obtain a GPA of 3.5 or higher in the courses in the major to be considered for the distinction of "Honors in the Major." The School of Engineering reserves the right to withhold honors based on other criteria, such as an incident of academic dishonesty.

[Optional Catchall]**Requirements and Planners****Course Requirements**

The aim of this program is to expose students to a rigorous curriculum in computer science while maintaining sufficient flexibility so that students can take courses outside computer science, pursue a minor in another discipline, or complete a double major. Every student must complete a minimum of 16 courses—eight

lower-division and eight upper-division. Out of these, the eight lower-division courses and the first upper-division course are required preparatory courses for every student. Once these preparatory courses are completed, students tailor their own program by choosing seven upper-division elective courses.

Lower-Division Courses

Computer Science and Engineering

One of the following courses

CSE 13S	Computer Systems and C Programming	7
ECE 13	Computer Systems and C Programming	7

CSE 13S recommended

Plus all of the following

CSE 12	Computer Systems and Assembly Language	5
CSE 16	Applied Discrete Mathematics	5
CSE 20	Beginning Programming in Python	5
CSE 30	Programming Abstractions: Python	7

Students with no prior programming will take CSE 20 before CSE 30, and CSE 12. Students with a prior programming course, AP credit, or clearing the “Test-out” bar will start with CSE 30, and CSE 12.

Plus one of the following options

Either these courses

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

or these courses

MATH 20A	Honors Calculus	5
MATH 20B	Honors Calculus	5

Plus one of the following

AM 10	Mathematical Methods for Engineers I	5
MATH 21	Linear Algebra	5

Upper-Division Courses

The following course

CSE 101	Introduction to Data Structures and Algorithms	5
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Plus three of the following breadth courses

CSE 102	Introduction to Analysis of Algorithms	5
CSE 103	Computational Models	5

CSE 110A	Fundamentals of Compiler Design I	5
CSE 112	Comparative Programming Languages	5
CSE 115A	Introduction to Software Engineering	5
CSE 120	Computer Architecture	5
CSE 130	Principles of Computer Systems Design	5
CSE 132	Computer Security	5
CSE 138	Distributed Systems	5
CSE 140	Artificial Intelligence	5
CSE 142	Machine Learning	5
CSE 143	Introduction to Natural Language Processing	5
CSE 144	Applied Machine Learning	5
CSE 160	Introduction to Computer Graphics	5
CSE 160L	Introduction to Computer Graphics Laboratory	2
CSE 180	Database Systems I	5

CSE 160 and CSE 160L lecture/lab combination counts as one course.

Electives

Three courses from the list of B.A. electives below, including at least one upper-division computer science and engineering course(s) numbered below 170, or numbered between 180 and 189, or CSE 195.

For other courses, computational media, and Applied Mathematics and Statistics courses are strongly recommended.

List of BA electives

- Any 5-credit upper-division course offered by the Baskin School of Engineering, except for the DC courses CSE 115A and CSE 185E/CSE 185S.
- Or any course from the following list:

ARTG 118	Character Creation for Video Games	5
EART 124	Modeling Earth's Climate	5
EART 125	Statistics and Data Analysis in the Geosciences	5
EART 172	Geophysical Fluid Dynamics	5
ECON 100M	Intermediate Microeconomics, Math Intensive	5
ECON 100N	Intermediate Macroeconomics, Math Intensive	5
ECON 101	Managerial Economics	5
ENVS 115A	Geographic Information Systems and Environmental Applications	5
ENVS 115L	Exercises in Geographic Information Systems	2
FILM 170A	Fundamentals of Digital Media Production	5

LING 112	Syntax I	5	CSE 110B	Fundamentals of Compiler Design II	5
LING 113	Syntax II	5	CSE 115C	Software Design Project II	5
LING 118	Semantics III	5	CSE 115D	Software Design Project - Accelerated	5
LING 125	Foundations of Linguistic Theory	5	CSE 121	Microprocessor System Design	5
MATH 110	Introduction to Number Theory	5	CSE 121L	Microprocessor System Design Laboratory	2
MATH 115	Graph Theory	5	CSE 134	Embedded Operating Systems	5
MATH 116	Combinatorics	5	CSE 138	Distributed Systems	5
MATH 117	Advanced Linear Algebra	5	CSE 140	Artificial Intelligence	5
MATH 118	Advanced Number Theory	5	CSE 143	Introduction to Natural Language Processing	5
MATH 134	Cryptography	5	CSE 144	Applied Machine Learning	5
MATH 145	Introductory Chaos Theory	5	CSE 156	Network Programming	5
MATH 145L	Introductory Chaos Laboratory	1	CSE 156L	Network Programming Laboratory	2
MATH 148	Numerical Analysis	5	CSE 157	Internet of Things	7
MATH 160	Mathematical Logic I	5	CSE 160	Introduction to Computer Graphics	5
MATH 161	Mathematical Logic II	5	CSE 160L	Introduction to Computer Graphics Laboratory	2
MUSC 123	Electronic Sound Synthesis	5	CSE 161	Introduction to Data Visualization	5
MUSC 124	Intermediate Electronic Sound Synthesis	5	CSE 161L	Data Visualization Laboratory	2
MUSC 125	Advanced Electronic Sound Synthesis	5	CSE 162	Advanced Computer Graphics and Animation	5
PHYS 115	Computational Physics	5	CSE 162L	Advanced Computer Graphics and Animation Laboratory	2
PHYS 150	Quantum Computing	5	CSE 163	Data Programming for Visualization	5
			CSE 168	Introduction to Augmented Reality and Virtual Reality	7
			CSE 181	Database Systems II	5
			CSE 183	Web Applications	5
			CSE 184	Data Wrangling and Web Scraping	5
			CMPM 172	Game Design Studio III	7
			ECE 118	Introduction to Mechatronics	10

Lecture/lab combinations count as one course.

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement.

The DC requirement for the computer science B.A. is satisfied by completing one of the following additional courses:

One of these courses		
CSE 115A	Introduction to Software Engineering	5
CSE 185E/CSE 101	Technical Writing for Computer Science and Engineering	5
CSE 195	Senior Thesis Research	5

The course used for the DC requirement cannot also be used as an upper-division elective.

Comprehensive Requirement

In addition to the above B.A. requirements, students in the computer science majors must satisfy one of the following two exit requirements: pass one of the capstone courses (see Capstone Courses below); or successfully complete a senior thesis. A passed capstone course also counts toward satisfying the minimum number of upper-division electives requirement.

Capstone Courses

Students may choose from one of the following capstone courses to satisfy their exit requirement (lecture/lab combinations count as one course.):

Senior Thesis

The senior thesis consists of a self-contained project within the broad scope of computer science, but one that is not available in the regular course offerings. A student wishing to complete a senior thesis must successfully complete a minimum of 5 credits in CSE 195, Senior Thesis Research. The supervision of a senior thesis student is always at the discretion of the faculty member.

The student first submits a written thesis proposal and obtains approval of a faculty sponsor. Then the student submits a written draft and makes an oral presentation to a faculty examining committee. After receiving feedback from the examining committee, the student submits one or more additional drafts, until the final draft is approved by the examining committee. The total amount of writing shall be consistent with the campus Disciplinary

Communication requirement. A passing grade in CSE 195 is earned when the final thesis is approved.
 CSE 195 Senior Thesis Research 5

Planners

The following are three sample academic plans: (1) a four-year plan for the B.A. major for first-year students with programming experience; (2) an alternative first-year plan for students without programming experience; and (3) a two-year plan for the B.A. major for transfer students.

Students completing the courses in the planners will have satisfied the MF general education requirement.

Four-Year Plan for Students with Programming Experience

	Fall	Winter	Spring
1st (frosh)	CSE 30 MATH 19A	CSE 12 MATH 19B	CSE 16
2nd (soph)	CSE 13S	AM 10	CSE 101
3rd (junior)	Breadth course 1 Elective list 1	Breadth course 2 Elective list 2	Breadth course 3
4th (senior)	DC elective		Elective list 3 (capstone)

First-Year Plan for Students Without Programming Experience

	Fall	Winter	Spring
1st (frosh)	CSE 20 MATH 3	CSE 30 MATH 19A	CSE 12 MATH 19B
2nd (soph)	CSE 13S	AM 10 CSE 16	CSE 101
3rd (junior)	Breadth course 1 Elective	Breadth course 2 Elective	Breadth course 3

list 1 list 2

4th (senior) DC elective Elective list 3 (capstone)

Two-Year Degree Planner for Transfer Students

	Fall	Winter	Spring
1st (junior)	CSE 12 AM 10 or MATH 21	CSE 101	Breadth list 1
2nd (senior)	Breadth list 2 Elective list 1	Breadth list 3 Elective list 2	DC elective Elective list 3 (capstone)

Note: One elective must be drawn from the DC course list and one from the capstone course.

Curriculum charts for all BSOE majors are available at the department's Major Curriculum Charts page.

NETWORK AND DIGITAL TECHNOLOGY B.A.

Information and Policies

Introduction

The UC Santa Cruz B.A. in network and digital technology provides students with in-depth knowledge of the underlying structure and function of network and computer technology and the design processes that make those technologies function. The program is tailored to students who wish to combine technology with other fields or have a general focus on digital design or computer networks. The B.A. in network and digital technology is not an engineering degree, but B.A. graduates will be prepared to work with technology development in other capacities, or join the computer network workforce. Students interested in graduate study should pursue a B.S. program.

Academic Advising for the Program

The Baskin School of Engineering undergraduate advising office offers general advising for prospective and declared undergraduates majoring in School of Engineering programs. The office handles major declarations, transfer credits, course substitutions, articulations, and degree certifications. Undergraduate students obtain and submit all paperwork requiring

departmental approval to the undergraduate advising office. Transfer students should also refer to the Transfer Information and Policy section.

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Getting Started in the Major

Program Learning Outcomes

For the Network and Digital Technology B.A. degree the program learning outcomes are:

- an ability to apply knowledge of mathematics, science, and engineering;
- an ability to design a system, component, or process;
- an ability to communicate effectively; and
- an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Major Qualification Policy and Declaration Process

Major Qualification

Qualification for the network and digital technology major is based on performance in the following lower-division courses and associated labs required for the major. To qualify for the network and digital technology major students must have completed at least 36 credits in these courses with a cumulative GPA of at least 2.30 or greater.

All of the following

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

Plus one of the following

AM 30	Multivariate Calculus for Engineers	5
MATH 23A	Vector Calculus	5

Plus one of the following

AM 10	Mathematical Methods for Engineers I	5
MATH 21	Linear Algebra	5

Plus one of the following

AM 20	Mathematical Methods for Engineers II	5
MATH 24	Ordinary Differential Equations	5

Plus the following

CSE 12	Computer Systems and Assembly Language	5
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Plus one of the following

CSE 13S	Computer Systems and C Programming	7
ECE 13	Computer Systems and C Programming	7

Plus all of the following

CSE 16	Applied Discrete Mathematics	5
CSE 30	Programming Abstractions: Python	7

Plus one of the following lecture/lab options

Either these courses		
PHYS 5A	Introduction to Physics I	5
PHYS 5L	Introduction to Physics I Laboratory	1
or these courses		
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1

Plus one of the following lecture/lab combinations

Either these courses		
PHYS 5C	Introduction to Physics III	5
PHYS 5N	Introduction to Physics Laboratory III	1
or these courses		
PHYS 6C	Introductory Physics III	5
PHYS 6N	Introductory Physics III Laboratory	1

Cumulative GPA

Students seeking to change their current major to network and digital technology after their sixth quarter must have completed the courses listed above with a cumulative GPA of at least 2.30.

Appeal Process

Students who are informed that they do not qualify for the major may appeal this decision by submitting a letter to the undergraduate director through the Baskin School of Engineering undergraduate advising office within 15 days from the date the notification was mailed. Within 15 days of receipt of the appeal, the department will notify the student, college, and Office of the Registrar of the decision.

How to Declare a Major

There are four steps to declaring a BSOE major. For a detailed guide to this process, please consult Baskin Engineering's Declare Your Major website.

Students should start the declaration of major process by completing Step One on the BSOE Declare Your Major website as soon as they complete 36 credits in the major qualification courses or reach their declaration deadline quarter, whichever comes first.

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed enough major qualification courses.

Transfer Information and Policy

Transfer Admission Screening Policy

Students should complete at least six courses from the following list

Lecture/lab combinations count as one course.

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
AM 10	Mathematical Methods for Engineers I	5
MATH 21	Linear Algebra	5
AM 20	Mathematical Methods for Engineers II	5
MATH 24	Ordinary Differential Equations	5
AM 30	Multivariate Calculus for Engineers	5
MATH 23A	Vector Calculus	5
CSE 12	Computer Systems and Assembly Language	5
CSE 13S	Computer Systems and C Programming	7
CSE 16	Applied Discrete Mathematics	5
CSE 30	Programming Abstractions: Python	7
ECE 13	Computer Systems and C Programming	7
PHYS 5A	Introduction to Physics I	5
PHYS 5L	Introduction to Physics I Laboratory	1
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 5C	Introduction to Physics III	5
PHYS 5N	Introduction to Physics III Laboratory III	1
PHYS 6C	Introductory Physics III	5
PHYS 6N	Introductory Physics III Laboratory	1

AM 30 and MATH 23A are alternatives; only one or the other, whichever is completed first, can count toward the six courses.

AM 10 and MATH 21 are alternatives; only one or the other, whichever is completed first can count toward the six courses.

AM 20 and MATH 24 are alternatives; only one or the other, whichever is completed first can count toward the six courses.

ECE 13 and CSE 13S are alternatives; only one or the other, whichever is completed first, can count toward the six courses.

PHYS 5A and PHYS 5L are alternatives to PHYS 6A and PHYS 6L; only one or the other can count toward the six courses.

PHYS 5C and PHYS 5N are alternatives to PHYS 6C and PHYS 6N; only one or the other can count toward the six courses.

Getting Started at UCSC as a Transfer Student

Transfer students should declare their major in their first quarter at UC Santa Cruz. Instructions for declaring a major in the Baskin School of Engineering are on the department's major declaration page.

Letter Grade Policy

All students admitted to a School of Engineering major, or seeking admission to a major, must take all courses required for that major for a letter grade. This policy includes courses required for these degrees that are sponsored by other departments.

[Optional Catchall]

Course Substitution Policy

Undergraduate engineering students who wish to substitute a major course with a course from another department at UC Santa Cruz, or from another academic institution, must first seek approval through the School of Engineering Undergraduate Advising Office. The advising office requires a Petition for Course Substitution be approved before credit for an alternate course can be applied to any School of Engineering major requirement.

Petition forms are available at the Undergraduate Advising Office and online.

Petitions and procedures for approval must be obtained from and submitted to the Undergraduate Advising Office.

Double Majors and Major/Minor Combinations Policy

Students completing the Network and Digital technology B.A. cannot also receive the computer engineering minor.

Students completing the Robotics Engineering B.S. or the Computer Engineering B.S. cannot receive the Network and Digital Technology B.A. degree.

Study Abroad

Honors

Majors are considered for “Honors in the Major” and “Highest Honors in the Major” based on their GPA and on results of undergraduate research and other significant contributions to the School of Engineering. Students with a GPA of 3.70, in most cases, receive highest honors. Students with a GPA of 3.30, in most cases, receive honors. Students with particularly significant accomplishments in undergraduate research or contributions to the School of Engineering may be considered with a lower GPA.

School of Engineering Policies

Please refer to the School of Engineering section of the catalog for additional policies that apply to all School of Engineering programs.

Materials Fee and Miscellaneous Fees

Please see the section on fees under the School of Engineering.

Requirements and Planners

Course Requirements

All students in the network and digital technology major must take the following courses. The comprehensive requirement is satisfied by completion of the capstone course and the portfolio exit requirement.

Lower-Division Courses

Students who may have originally pursued another major should discuss with the Baskin School of Engineering undergraduate advising office whether or not already completed coursework may be substituted for one or more lower division-requirements.

One of the following

AM 10	Mathematical Methods for Engineers I	5
MATH 21	Linear Algebra	5

Plus one of the following

AM 20	Mathematical Methods for Engineers II	5
MATH 24	Ordinary Differential Equations	5

Plus one of the following

AM 30	Multivariate Calculus for Engineers	5
MATH 23A	Vector Calculus	5

Plus the following

CSE 12	Computer Systems and Assembly Language	5
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Plus one of the following

CSE 13S	Computer Systems and C Programming	7
ECE 13	Computer Systems and C Programming	7

Plus all of the following

CSE 16	Applied Discrete Mathematics	5
CSE 20	Beginning Programming in Python	5
CSE 30	Programming Abstractions: Python	7
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

Students with no prior programming will take CSE 20 before CSE 30 and CSE 12. Students with a prior programming course, AP credit, or clearing the “Test-out” bar will start with CSE 30 and CSE 12.

Plus one of the following lecture/lab combinations

Either these courses		
PHYS 5A	Introduction to Physics I	5
PHYS 5L	Introduction to Physics I Laboratory	1
or these courses		
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1

Plus one of the following lecture/lab combinations

Either these courses		
PHYS 5C	Introduction to Physics III	5
PHYS 5N	Introduction to Physics Laboratory III	1
or these courses		
PHYS 6C	Introductory Physics III	5
PHYS 6N	Introductory Physics III Laboratory	1

Upper-Division Courses

All of the following

CSE 100	Logic Design	5
CSE 100L	Logic Design Laboratory	2
CSE 150	Introduction to Computer Networks	5
CSE 150L	Introduction to Computer Networks Laboratory	2

CSE 185E/CSE 101	Technical Writing for Computer Science and Engineering	5
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Plus one of the following options

Either this course

CSE 101	Introduction to Data Structures and Algorithms	5
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or these courses

ECE 101	Introduction to Electronic Circuits	5
ECE 101L	Introduction to Electronic Circuits Laboratory	2

Electives

Three additional 5-credit, upper-division electives, and associated laboratories, from the approved list (p. 504) or the department's approved list of electives.

Digital Technology Focus

Students wishing to focus on digital technology should consider including among their courses the following (lecture-lab combinations are counted as one course):

CSE 120	Computer Architecture	5
CSE 121	Microprocessor System Design	5
CSE 125	Logic Design with Verilog	5
ECE 101	Introduction to Electronic Circuits	5
ECE 101L	Introduction to Electronic Circuits Laboratory	2
ECE 118	Introduction to Mechatronics	10

Network Technology Focus

Students wishing to focus on network technology should consider including among their courses the following (lecture-lab combinations are counted as one course):

CSE 101	Introduction to Data Structures and Algorithms	5
CSE 130	Principles of Computer Systems Design	5
CSE 151	Advanced Computer Networks	5
CSE 151L	Advanced Computer Networks Laboratory	2
CSE 156	Network Programming	5
CSE 156L	Network Programming Laboratory	2

Students can only take either CSE 130 or CSE 131.

Advisor

In all cases, students should discuss their interests and elective choices with their faculty advisor.

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division disciplinary communication (DC) requirement. The DC requirement in network and digital technology is satisfied by completing CSE 185E, Technical Writing for Computer Engineers.

CSE 185E/CSE 101	Technical Writing for Computer Science and Engineering	5
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Comprehensive Requirement

One of the following courses must be completed. This course cannot be counted as one of the three required electives. Lecture/lab combinations count as one course.

CSE 115A	Introduction to Software Engineering	5
CSE 121	Microprocessor System Design	5
CSE 125	Logic Design with Verilog	5
CSE 156	Network Programming	5
CSE 156L	Network Programming Laboratory	2
ECE 118	Introduction to Mechatronics	10

Planners

The following are two sample academic plans: (1) a four-year plan for first-year students with no prior programming experience, and (2) a two-year plan for transfer students that have completed all lower-division major requirements except AM 30, CSE 12 and CSE 12L, CSE 13E or CSE 13S, and CSE 30. Students completing the courses in the four-year planner will have satisfied the MF and SI General Education requirements.

Four-Year Major Planner for Network and Digital Technology

	Fall	Winter	Spring
1st (frosh)	MATH 3	MATH 19A	MATH 19B
	CSE 20	CSE 12 & CSE 12L	CSE 13E
2nd (soph)	CSE 16	PHYS 5A & PHYS 5L	AM 20
	AM 10	AM 30	PHYS 5C & PHYS 5N
3rd (jr)	ECE 101 & ECE 101L	CSE 100 & CSE 100L	CSE 150 & CSE 150L
		CSE 30	Elective

4th (sr)	CSE 185E	Elective	Capstone course
	Elective		

prior programming course, AP credit, or clearing the “Test-out” bar will start with CSE 30, and CSE 12 and CSE 12L.

Plus one of the following

AM 20	Mathematical Methods for Engineers II	5
MATH 24	Ordinary Differential Equations	5

AM 20 and MATH 24 both require one additional mathematics course as a prerequisite.

Plus one of the following lecture/lab combinations

Either these courses		
PHYS 5A	Introduction to Physics I	5
PHYS 5L	Introduction to Physics I Laboratory	1
or these courses		
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1

Plus one of the following lecture/lab combinations

Either these courses		
PHYS 5C	Introduction to Physics III	5
PHYS 5N	Introduction to Physics Laboratory III	1
or these courses		
PHYS 6C	Introductory Physics III	5
PHYS 6N	Introductory Physics III Laboratory	1

Two-Year Planner for Transfer Students

	Fall	Winter	Spring
1st (jr)	AM 30	CSE 100 & CSE 100L	CSE 150 & CSE 150L
	ECE 101 & ECE 101L	CSE 30	Elective
	CSE 12 & CSE 12L	CSE 13E or CSE 13S	
2nd (sr)	CSE 185E	Elective	Capstone course
	Elective		

Curriculum charts for all BSOE majors are available at the department's website.

COMPUTER ENGINEERING MINOR

Course Requirements

Lower-Division Courses

The following course

CSE 12	Computer Systems and Assembly Language	5
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Plus one of the following

CSE 13S	Computer Systems and C Programming	7
ECE 13	Computer Systems and C Programming	7

Plus all of the following

CSE 16	Applied Discrete Mathematics	5
CSE 20	Beginning Programming in Python	5
CSE 30	Programming Abstractions: Python	7
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

Students with no prior programming will take CSE 20 before CSE 30, and CSE 12 & CSE 12L. Students with a

Upper-Division Courses

All of the following

CSE 100	Logic Design	5
CSE 100L	Logic Design Laboratory	2
CSE 120	Computer Architecture	5

Plus one of the following

ECE 118	Introduction to Mechatronics	10
CSE 121	Embedded System Design	7

Plus all of the following

CSE 101	Introduction to Data Structures and Algorithms	5
ECE 101	Introduction to Electronic Circuits	5
ECE 101L	Introduction to Electronic Circuits Laboratory	2

COMPUTER SCIENCE MINOR

Course Requirements

Thirteen courses are required for the computer science minor.

Lower-Division Courses**One of the following options**

Either these courses

MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5

or these courses

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

or these courses

MATH 20A	Honors Calculus	5
MATH 20B	Honors Calculus	5

Plus one of the following

AM 10	Mathematical Methods for Engineers I	5
MATH 21	Linear Algebra	5

Plus the following

CSE 12	Computer Systems and Assembly Language	5
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Plus one of the following

CSE 13S	Computer Systems and C Programming	7
ECE 13	Computer Systems and C Programming	7

Plus all of the following

CSE 16	Applied Discrete Mathematics	5
CSE 20	Beginning Programming in Python	5
CSE 30	Programming Abstractions: Python	7

Upper-Division Courses**The following course**

CSE 101	Introduction to Data Structures and Algorithms	5
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Plus two upper-division computer science and engineering courses from the following list

CSE 102	Introduction to Analysis of Algorithms	5
CSE 103	Computational Models	5
CSE 110A	Fundamentals of Compiler Design I	5
CSE 112	Comparative Programming Languages	5
CSE 115A	Introduction to Software Engineering	5
CSE 120	Computer Architecture	5

CSE 130	Principles of Computer Systems Design	5
CSE 132	Computer Security	5
CSE 138	Distributed Systems	5
CSE 140	Artificial Intelligence	5
CSE 142	Machine Learning	5
CSE 143	Introduction to Natural Language Processing	5
CSE 160	Introduction to Computer Graphics	5
CSE 160L	Introduction to Computer Graphics Laboratory	2
CSE 180	Database Systems I	5

Students choosing CSE 160 must also take CSE 160L, and the combination counts as one course.

Plus two additional upper-division courses

Two additional upper-division 5-credit computer science and engineering courses and their associated labs, numbered below 170 or between 180 and 189.

COMPUTER SCIENCE AND ENGINEERING CONTIGUOUS BACHELOR'S/MASTER'S PATHWAY: COMPUTER SCIENCE AND ENGINEERING

The Department of Computer Science and Engineering (CSE) offers a combined Bachelor's/Master's pathway. Undergraduate students from any major in the Baskin School of Engineering (BSOE) can apply to the pathway in order to earn a bachelor's degree together with an M.S. degree in Computer Science and Engineering. Depending on the student's progress and advance planning, it is expected that the combined pathway can be completed in five years.

The five-year Bachelor's/Master's pathway offers a competitive edge to students who are completing their undergraduate degree at UC Santa Cruz, by enabling those with advanced preparation to move directly from the undergraduate to the graduate program. The pathway assists qualified enrolled students with a simplified graduate application process that does not require students to take the Graduate Record Examination (GRE) and makes it possible to complete an M.S. degree with as few as seven courses beyond the bachelor's degree.

The pathway prepares students for leadership positions in industry, and is also attractive for undergraduate students planning to pursue a Ph.D. degree targeting research careers in industry or academia. The School of Engineering (SOE) has many opportunities for undergraduate and graduate research, and Bachelor's/Master's pathway students may be able to continue their undergraduate research projects as graduate students with the same research group.

Students in the M.S. programs are not guaranteed any form of financial support from the department. It is the student's responsibility to ensure that they have sufficient funds for completing the M.S. degree program. Most M.S. students manage their finances by working as interns at companies in the Bay Area during the summer months.

Particularly motivated students can complete both the bachelor's and the master's degrees in 15 quarters. However, advance planning is essential. Interested students should contact the BSOE Graduate Affairs Office and their faculty adviser early in their college career—no later than the end of their junior year. Students in this pathway retain undergraduate status until the completion of all undergraduate requirements, but may begin graduate coursework in advance of graduate standing.

ADMISSION TO THE CONTIGUOUS FIVE-YEAR BACHELOR'S/MASTER'S PATHWAY

The undergraduate degree requirements are not changed by the Bachelor's/Master's pathway; however, the pathway capitalizes on graduate-level courses that may apply toward both the undergraduate and graduate degree requirements (see Course Requirements below). Students should consult the Undergraduate Affairs Office with questions about their respective undergraduate degree requirements.

Acceptance into the CSE Bachelor's/Master's pathway is by informal application, and is very simple. Students interested in the Bachelor's/Master's pathway should declare their interest to the Graduate Affairs Office, and attend a Bachelor's/Master's Workshop (typically offered in the fall and spring quarters). Undergraduates interested in the pathway can complete the interest form at any time starting in the first quarter of junior standing. To qualify, applicants must be current UC Santa Cruz undergraduates declared in a major within the School of Engineering, must have a 3.0 GPA when they apply to the Bachelor's/Master's pathway, and must maintain a 3.0 GPA or higher until the completion of their undergraduate requirements. The Graduate Affairs Office will verify and track students' eligibility for the pathway until completion of the bachelor's degree. Applicants who maintain eligibility through completion of their undergraduate program will not be required to submit GRE scores when completing the CSE M.S. graduate admission application.

Confirmed eligibility for the Bachelor's/Master's pathway does not guarantee admission to the CSE M.S. program. Pathway applicants must formally apply and be admitted to the Computer Science and Engineering Master's program through the regular graduate admissions process, although the GRE requirement is waived. The CSE M.S. application deadline is usually in

December or early January. Students who apply to the M.S. program through the Bachelor's/Master's pathway are not guaranteed admission to the M.S. program—they will be measured against the full applicant pool during the admissions decisions process. If admitted to the CSE M.S. program, pathway students are able to count qualified courses previously completed as an undergraduate toward their CSE M.S. degree requirements. To ensure courses are qualified to count toward the M.S. degree, students should review the CSE M.S. degree requirements and communicate with their graduate student adviser.

Students who do not meet the Bachelor's/Master's pathway eligibility requirements or who wish to take time off between the bachelor's and master's degree programs are encouraged to apply for admission to the standard CSE M.S. program through the regular graduate admissions process.

COURSE REQUIREMENTS

Master's students can graduate by pursuing either Thesis Plan I or a Capstone Plan II. The Thesis Plan I is appropriate for students interested in advanced studies and in carrying out independent research, as well as for those students contemplating pursuit of a Ph.D. degree. The Thesis Plan I may extend the normative time for graduation beyond the expected one year as students typically take two to three quarters to complete a thesis. Advance planning is essential to graduate from the CSE M.S. program with the Thesis Plan I in one year. The Capstone Plan II is appropriate for students interested in advanced studies to better prepare themselves in the information technology workforce. The normative time for graduation with Capstone Plan II is one year for a full-time student.

Students may count up to 13 credits of courses taken as an undergraduate toward the M.S. coursework requirements. Of these 13 course credits, no more than 5 can be from undergraduate courses, and the undergraduate course credits must not be used to satisfy any undergraduate degree requirements. A minimum of 35 credits of graduate coursework must be completed during the graduate career. At most one upper-division undergraduate course can be counted toward the M.S. degree requirements.

Students should refer to the CSE M.S. program statement for more specific information on degree requirements, concentrations, academic progress, and applying to graduate.

COMPUTER SCIENCE AND ENGINEERING M.S.

Introduction

The Computer Science and Engineering Department offers a master of science (M.S.) degree program. An M.S. student can graduate by pursuing either Thesis Plan

I or Capstone Plan II. The normative time for graduation with Thesis Plan I is two years for a full-time student. This option is appropriate for students interested in advanced studies and in carrying out independent research, as well as for those students contemplating pursuit of a Ph.D. degree. The normative time for graduation with Capstone Plan II is one year for a full-time student. This option is appropriate for students interested in advanced studies to better prepare themselves in the information technology workforce. Students in the M.S. programs are not guaranteed any form of financial support from the department. It is the student's responsibility to ensure that they have sufficient funds for completing the M.S. degree program. Most M.S. students manage their finances by working as interns at companies in the Bay Area during the summer months.

Requirements

Course Requirements

CSE 200	Research and Teaching in Computer Science and Engineering	3
CSE 201	Analysis of Algorithms	5
CSE 210A	Programming Languages	5
CSE 220	Computer Architecture	5

Thesis Plan I

Each student is required to take 48 credits as follows:

- 1.) A core requirement must be met by taking CSE 200, Research and Teaching in Computer Science and Engineering (CSE), and any two out of the following three courses: CSE 201, Analysis of Algorithms; CSE 210A, Programming Languages; and CSE 220, Computer Architecture. In addition, students must take 5 credits of CSE 299, Thesis Research. Each student must complete CSE 200 in their first year.
- 2.) One course each from three different breadth categories for a total of three courses (15 credits)—see the Breadth Requirements webpage.
- 3.) Up to 10 credits of CSE 299 may be counted toward the degree requirements; 5 credits are required.
- 4.) All remaining courses must be regular, 5-credit graduate courses (not seminars). Courses that do not count toward the 48 credits requirement include all courses numbered CSE 296, and all courses in the CSE 280 and CSE 297 series.
- 5.) Up to 10 credits from courses taught by departments other than CSE may be counted toward the degree requirements. The student must obtain the graduate director's authorization to count a course from outside of the Baskin School of Engineering.
- 6.) Upper-division undergraduate UCSC CSE courses may be taken as a graduate student to strengthen a student's knowledge base. At most, 5 credits of UCSC upper-division undergraduate CSE courses may be counted toward the 48 credits requirement.

7.) With the exception of CSE 200, CSE 296, and all courses in the CSE 280 and CSE 299 series, all graduate courses and upper-division courses must be taken for a letter grade. Only courses with a letter grade of B- or higher can be counted toward the M.S. degree requirements.

Capstone Plan II

Each student is required to take 48 credits as follows:

- 1.) A core requirement must be met by taking CSE 200, Research and Teaching in Computer Science and Engineering (CSE), and any two out of the following three courses: CSE 201, Analysis of Algorithms; CSE 210A, Programming Languages; and CSE 220, Computer Architecture. In addition, students must take 5 credits of CSE 297, Independent Study or CSE 247, Projects in Artificial Intelligence. Each student must complete CSE 200 in their first year.
- 2.) One course each from three different breadth categories for a total of three courses (15 credits)—see the Breadth Requirements webpage.
- 3.) All remaining courses must be regular, 5-credit graduate courses (not seminars). Courses that do not count toward the 48-credit requirement include all courses numbered CSE 296, and all courses in the CSE 280 and CSE 299 series. CSE 297 may be taken more than once; however, only 5 credits of CSE 297 will be counted toward the required 48 credits.
- 4.) Up to 10 credits from courses taught by departments other than CSE may be counted toward the degree requirements. The student must obtain the graduate director's authorization to count a course from outside of the Baskin School of Engineering.
- 5.) Upper-division undergraduate UCSC CSE courses may be taken as a graduate student to strengthen a student's knowledge base. At most, 5 credits of UCSC upper-division undergraduate CSE courses may be counted toward the 48 credits requirement.
- 6.) With the exception of CSE 200 and all courses in the CSE 280 and CSE 297 series, all graduate courses and upper-division courses must be taken for letter grade. Only courses with a letter grade of B- or higher can be counted toward the M.S. degree requirements.

Other Requirements

Students in Thesis Plan I must complete an M.S. thesis, while students in Capstone Plan II must complete an M.S. project.

Thesis Plan I

After the student has completed some coursework in the proposed area of research and become acquainted with the faculty conducting research in that area, a student electing Thesis Plan I submits a written proposal to a faculty member, usually by the third academic quarter. If the faculty member determines they are able to advise the

student's thesis, they collaborate with the student to further develop the scope of the student's research and refine the proposal. By accepting the proposal, the faculty member becomes the student's faculty/thesis advisor. In consultation with the advisor, the student forms a Master's Thesis Reading Committee with at least two additional faculty members, each of whom is provided a copy of the proposal. Exceptions to the committee structure may be granted by the graduate program director and/or by the graduate dean. Changes in the membership of the committee, once appointed, may only be made with the approval of the graduate dean.

Members of a Master's Thesis Reading Committee must meet the following criteria:

1. The first member must be a Senate CSE faculty member.
2. The second member must be a Senate UCSC Baskin School of Engineering (BSOE) faculty member (may be CSE as well).
3. The third member must be a UCSC BSOE faculty member or a recognized expert in the student's research area as judged by the graduate program director and the Graduate Division dean.

Additional members may be added to the committee. Students should consult their advisors about the membership of their committee.

By the end of the second week of the quarter in which a student plans to graduate, the student must submit a formal nomination of their Master's Thesis Reading Committee to the Graduate Division for approval. The required form for nominating a Master's Thesis Reading Committee is located on the Graduate Division's website. Once the thesis is completed, the student presents an expository talk on the thesis research. A final draft of the thesis must be provided to the members of the Master's Thesis Reading Committee for review at least 30 days before the last day of the quarter in which the student plans to graduate. The final thesis must be accepted by the Master's Thesis Reading Committee before the M.S. degree is awarded.

CSE 299A Thesis Research 5

Capstone Plan II

The M.S. project is an individual or a team-based project supervised by a faculty advisor and approved by a Master's Project Reading Committee composed of the faculty advisor and a faculty member from the Baskin School of Engineering.

Members of a Master's Project Reading Committee must meet the following criteria:

1. The first member must be a Senate CSE faculty member.
2. The second member must be a Senate UCSC School of Engineering (SOE) faculty (may be CSE as well).

Master's Project Reading Committees are nominated by completing a Master's Project form and are approved by the graduate director.

A team consists of up to five members. Projects can either be proposed by the team or the team may bid on projects proposed by faculty members. It is also possible to have industry-sponsored or government-sponsored projects, in which case the industry/government supervisor can be invited to be an optional third member on the Master's Project Reading Committee.

The final project must be accepted by the Reading Committee before the M.S. degree is conferred.

CSE 297A Individual Study or 5
Research

Transfer Credit

Up to three School of Engineering courses fulfilling the degree requirements of the M.S. degree may be taken before beginning the graduate program through the concurrent enrollment program.

Courses from other institutions may be substituted for equivalent courses at UCSC (with the approval of the graduate director) but may not count toward the 48-credit requirement. For example, an equivalent Computer Architecture course taken elsewhere may be used in lieu of CSE 220. However, the student will need to replace it with 5 credits of another graduate elective course. As another example, a student may substitute an equivalent graduate course for CSE 260 and count that for a breadth requirement, but may not count that course toward the 48-credit requirement.

Petitions should be submitted along with the transcript from the other institution or UCSC Extension. For courses taken at other institutions, copies of the syllabi, exams, and other coursework should accompany the petition. Such petitions are not considered until the completion of at least one quarter at UC Santa Cruz.

At most, a total of three courses may be transferred from concurrent enrollment and other institutions.

Concentrations

M.S. students are offered the option to receive a concentration. Concentrations denote areas of specialized curriculum, training, and research within a given department or degree-granting program. The concentration is an informal indication of a student's area of expertise. No notation of it appears on the student's transcript or diploma. However, the student will have the right to note the concentration in their curriculum vitae using the words "a degree in CSE with a concentration in XXX." The department may refer to the student's degree with the concentration noted, and writers of letters of reference may note the concentration when referring to the student's degree.

There are four possible concentrations available to CSE M.S. students:

- Artificial Intelligence
- Hardware Systems
- Software Systems
- Theory

In order to receive a concentration annotation, an M.S. student must satisfy three requirements:

1. Take two courses in the list of concentration-specific required courses.
2. Take one course in the list of concentration-specific elective courses.
3. Choose a faculty member in the concentration-specific list of affiliate faculty as project or thesis advisor.

The required and elective courses and the affiliated faculty for each concentration are available on our website.

Students normally request to receive a concentration annotation at the time they request to be assigned an advisor.

Academic Progress

Each year, the faculty reviews the progress of every student. Normative academic progress for master's students includes selecting a capstone plan (Thesis Plan I or Capstone Plan II) and identifying a faculty advisor by the end of the third quarter. Many students complete the program in four quarters, and all full-time students are expected to complete the degree within six quarters.

Students without adequate academic preparation may be required to take additional courses. Full-time students are normally expected to complete the degree requirements at the rate of at least two courses per quarter. Full-time CSE students must complete CSE 201, CSE 210A, and CSE 220 within two years and normally must complete all course requirements within two years for the M.S.

Students receiving two or more unsatisfactory grades (U or a letter grade below B-) in School of Engineering courses are not making adequate progress and will be recommended for academic probation for the following three quarters of registered enrollment. Taking a leave of absence does not count as enrollment, and it does not extend the degree timeline. Part-time enrollment is counted as a half quarter of enrollment.

Students not making adequate progress toward completion of degree requirements (see the Graduate Student Handbook to review the policy on satisfactory academic progress) may be recommended for academic probation. Students who violate the terms of their academic probation are subject to dismissal from the program.

Should any CSE graduate student fail a School of Engineering course while on probation, the CSE

Department may request the graduate dean dismiss that student from the graduate program. If after being removed from probation the student again fails a School of Engineering course, they will return immediately to academic probation.

Graduate students experiencing circumstances or difficulties that impact their academic performance should contact their faculty advisor and the graduate director immediately. Students may appeal their dismissal.

Applying for Graduation

All candidates for a degree must submit an Application for Master's Degree to the Graduate Advising Office by the date stated in the Academic and Administrative Calendar for the quarter you wish to receive the degree. Failure to declare candidacy by the deadline means that you cannot be considered a candidate until the next term.

A student is required to be registered or on Filing Fee Status, whichever is applicable, during the quarter in which the degree is conferred. Students should consult the department advisor to determine which option fits their situation. For more information about applying for graduation, visit the Baskin School of Engineering Graduate Studies website.

COMPUTER SCIENCE AND ENGINEERING PH.D.

Introduction

The Computer Science and Engineering Department offers a doctorate (Ph.D.) degree program. The normative time for the Ph.D. program is five to six years for a full-time student. Students admitted to the Ph.D. program usually receive financial support in the form of a combination of fellowships, teaching assistantships, and/or graduate research assistantships.

Advancement to Candidacy

Course Requirements

Each student is required to take 58 credits as follows:

- A core requirement must be met by taking CSE 200, CSE 201, CSE 210A, and CSE 220.
- One course each from three different breadth categories for a total of three courses (15 credits)—see the Breadth Requirements webpage.
- Up to 10 credits of the CSE 297 series, Independent Study or Research; or the CSE 299 series, Thesis Research.
- All remaining courses must be regular, 5-credit graduate courses (not seminars). Courses that do not count toward the 58-credit requirement include CSE 296, and all courses numbered CSE 280. CSE 297 and/or CSE 299 may be taken more than

twice, however only 10 credits total of CSE 297 and/or CSE 299 will be counted toward the required 58 credits.

- At most 10 credits can be from courses taught by departments other than CSE. The student must obtain their advisor's authorization to take a course from outside of the Baskin School of Engineering.
 - Undergraduate courses do not count toward the 58-credit requirement.
- | | | |
|----------|---|---|
| CSE 200 | Research and Teaching in
Computer Science and
Engineering | 3 |
| CSE 201 | Analysis of Algorithms | 5 |
| CSE 210A | Programming Languages | 5 |
| CSE 220 | Computer Architecture | 5 |

Letter Grade Policy

Letter grading is required for all courses applied toward the Computer Science and Engineering Ph.D. degree with an exception for up to 10 credits of the student's choice and the following courses: CSE 200, Research and Teaching in Computer Science and Engineering; CSE 297, Independent Study or Research; CSE 299, Thesis Research; and seminar courses (CSE 280 series). With the exception of CSE 200, courses used to satisfy the core requirement must be taken for letter grade. This policy includes courses used for this degree that are sponsored by other departments. To ensure they will receive a letter grade, students should check that they have selected the letter grade option no later than the 15th day of instruction each quarter for each class in which they are enrolled.

Transfer Credit

Up to three courses (15 credits) can be transferred from another institution with approval by the CSE graduate director.

Petitions should be submitted along with the transcript from the other institution or UC Santa Cruz extension. For courses taken at other institutions, copies of the syllabi, exams, and other coursework should accompany the petition. Such petitions are not considered until the completion of at least one quarter at UCSC.

English Language Proficiency Requirement

Applicants whose native language is not English must take the Test of English as a Foreign Language (TOEFL) exam or the International English Language Testing System (IELTS) exam and submit an official score report with the admission application. For admission purposes, the minimum passing score for the TOEFL exam must be 570 on the paper-based, 230 on the computer-based, or 89 on the Internet-based test. The minimum passing score for the IELTS exam is 7. TOEFL/IELTS waivers for admission purposes may be requested by applicants who have completed a four-year bachelor's degree at an English-speaking institution.

To be considered for teaching assistant support, students must meet the English language requirement for teaching assistants. Students may satisfy this requirements in one of the following ways:

- Achieving a minimum score of 26 on the spoken portion of the Internet-based TOEFL;
- Achieving an overall score of 8 or higher on the IELTS;
- Participating in the Graduate Preparation Program (GPP);
- Passing Languages 210: Oral Communication in the U.S. Classroom: Strategies for International Teaching Assistants

Teaching Requirements

Each student is required to complete at least one quarter of teaching assistantship. This requirement can be met after advancement to candidacy. Certain exceptions may be permitted for those with extensive prior teaching experience or those who are not allowed to be employed due to visa regulations.

Qualifying Examination

A successful qualifying examination involves a student writing a thesis prospectus, presenting a public oral presentation of the proposed research, evaluation of the thesis prospectus and oral presentation by a qualifying examination committee that is approved by the Graduate Division, and an appointment of a reading committee for the dissertation (which may differ from the qualifying examination committee).

The oral qualifying examination is a presentation of the student's thesis prospectus and a test of the student's knowledge in advanced technical areas of relevance to the dissertation topic. This oral examination consists of a seminar-style talk before the examining committee, where the student describes the thesis prospectus, followed by questions from the committee on the substance of the talk and the areas of presumed expertise of the student.

To continue in the Ph.D. program, students must advance to candidacy by the end of their third year. The first step is identifying and formally nominating the qualifying exam committee. The members of the qualifying exam committee must include the following:

- 1.) The chair of the committee must be a tenured Senate SOE faculty member who is not the student's advisor.
- 2.) A Senate CSE faculty member (may be the advisor).
- 3.) A Senate UCSC faculty member or a recognized expert in the student's research area as judged by the graduate director and Graduate Division dean.
- 4.) The outside member must be a tenured Senate faculty member from a department other than CSE at UCSC or a recognized expert in the student's research area from

outside UCSC. The outside member may not be the student's advisor. In the event that the outside member is not from UCSC she/he must have credentials equivalent to a tenured faculty member as judged by the graduate director and the Graduate Division dean. The outside member's CV must be submitted along with the exam committee nomination form.

Additional members may be added to the committee. Students should consult their advisors about the membership of their committee. The committee must be approved by the graduate director. Exceptions to the committee requirements above may be granted by the graduate director when appropriate, as long as the committee meets the Graduate Division requirements. In order to pass the qualifying examination, the committee must come to unanimous agreement that the student has passed the exam, and the committee will provide a written report on the qualifying exam. The final step in the advancement process for the student is to identify and formally nominate a dissertation reading committee.

If the student does not pass the qualifying examination, the student may be asked to complete additional coursework, or other research-related work, before retaking the examination. The student may be allowed to retake the qualifying examination once, and the composition of the examining committee will remain the same for the second try. Students who fail the qualifying examination twice may be dismissed from the Ph.D. program, or given the option to exit with a master's degree.

Students are advanced to candidacy after they have completed the course requirements, passed the qualifying examination, cleared all incompletes from their records, have an appointed dissertation reading committee, and paid the advancement to candidacy fee.

Students who have not advanced to candidacy by the end of their third year (nine quarters) are recommended for academic probation, and are subject to dismissal from the program if they do not advance by the end of their fourth year (12 quarters).

Dissertation

Dissertation

Each student writes a Ph.D. dissertation which must be submitted to the reading committee at least one month prior to the dissertation defense. The members of the Dissertation Reading Committee must include the following:

- 1.) The advisor or supervisor of the student. This is the chair of the committee.
- 2.) A Senate SOE faculty member who is not the student's advisor. This member must be from CSE at UCSC if the advisor is not from CSE at UCSC.
- 3.) A Senate UCSC faculty or a recognized expert in the student's research area with credentials equivalent to a

Senate UCSC faculty member as judged by the graduate director and Graduate Division dean.

Additional members may be added to the committee. Students should consult their advisors about the membership of their committee. The Dissertation Reading Committee must be appointed in order to advance to candidacy. The committee must be approved by the graduate director. Exceptions to the committee requirements above may be granted by the graduate director when appropriate, as long as the committee meets the Graduate Division requirements.

The dissertation must show the results of in-depth research, be an original contribution of significant knowledge, and include material worthy of publication. Where appropriate, research internships with companies, government laboratories, or elsewhere are recognized (and may be required) as an integral part of the research leading to the dissertation.

Dissertation Defense

The candidate presents their research results in a public seminar sponsored by the dissertation supervisor. The seminar is followed by a defense of the dissertation to the public and the reading committee. The committee then decides whether the dissertation is acceptable or requires revision. Successful completion of the dissertation fulfills the final academic requirement for the Ph.D. degree.

Academic Progress

Each year, the faculty reviews the progress of every student. The department expects Ph.D. students to advance to candidacy by the end of the third year (nine quarters), and requires students to advance to candidacy by the end of the fourth year (12 quarters). Students are expected to complete the degree by the end of the fifth year (15 quarters), and required to do so by the end of the sixth year (18 quarters) in order to maintain good academic standing.

Students without adequate academic preparation may be required to take additional courses. Full-time students are normally expected to complete the degree requirements at the rate of at least two courses per quarter. Full-time CSE students must complete CSE 201, CSE 210A, and CSE 220 within two years and normally must complete all course requirements within three years.

Students receiving two or more unsatisfactory grades (U or letter grade below B-) in the School of Engineering (SoE) courses are not making adequate progress and will be recommended for academic probation for the following three quarters of registered enrollment. Taking a leave of absence does not count as enrollment, and it does not extend the degree timeline. Part-time enrollment is counted as a half quarter of enrollment.

Students not making adequate progress toward completion of degree requirements (see the Graduate Student Handbook for policy on satisfactory academic progress) may be recommended for academic probation.

Students who violate the terms of their academic probation are subject to dismissal from the program.

Ph.D. students who have not advanced to candidacy by the end of their third year (nine quarters) will be recommended for academic probation, and may be subject to dismissal from the program if not advanced to candidacy by the end of their fourth year (12 quarters).

Should any CSE graduate student fail a School of Engineering course while on probation, the CSE Department may request the graduate dean to dismiss the student from the graduate program. If after being removed from probation, the student again fails a School of Engineering course, they will return immediately to academic probation.

Graduate students experiencing circumstances or difficulties that impact their academic performance should contact their faculty advisor and the graduate director immediately. Students may appeal their dismissal.

Applying for Graduation

All candidates for a degree must submit an Application for Doctor of Philosophy Degree to the Graduate Advising Office by the date stated in the Academic and Administrative Calendar for the quarter you wish to receive the degree. Failure to declare candidacy by the deadline means that you cannot be considered a candidate until the next term.

A student is required to be registered or on Filing Fee Status, whichever is applicable, during the quarter in which the degree is conferred. Students should consult the department advisor to determine which option fits their situation. For more information about applying for graduation, visit the Baskin School of Engineering Graduate Studies website.

[Optional Catchall]

NATURAL LANGUAGE PROCESSING M.S.

Introduction

Natural Language Processing (NLP) focuses on the development of computer programs that can understand, generate, and learn from human language for useful purposes. It provides key capabilities for applications in many areas of artificial intelligence, and provides algorithms, methods and tools for analyzing both text or speech for such applications as conversational agents, machine translation, question answering, knowledge discovery from text, and sentiment analysis. The UC Santa Cruz professional Master of Science in Natural Language Processing program provides both depth and breadth in core algorithms and methods for NLP, and integrates foundational skills of data science and core aspects of linguistic theory in order to prepare program graduates to work in the natural language processing field

in industry, governmental agencies or nonprofit organizations. The degree is offered through the UCSC campus location in Silicon Valley, enabling connection and collaboration with local industry and a focus on career development. Students are expected to complete coursework in four academic quarters, without leaves of absence.

Course Requirements

The minimum credit requirement for the M.S. Degree in Natural Language Processing is 50 credits. All courses must be taken for a letter grade with the exception of seminar courses and up to 10 credits of the student's choice.

Core Courses

All students are required to take the following five core courses (25 credits):

NLP 201	Natural Language Processing I	5
NLP 202	Natural Language Processing II	5
NLP 203	Natural Language Processing III	5
NLP 220	Data Collection, Wrangling and Crowdsourcing	5
NLP 243	Machine Learning for Natural Language Processing	5

Electives

In addition, students are required to take two elective courses from the list below (10 credits):

NLP 244	Advanced Machine Learning for Natural Language Processing	5
NLP 245	Conversational Agents	5
NLP 267	Machine Translation	5
NLP 270	Linguistic Models of Syntax and Semantics for Computer Scientists	5
NLP 255	Topics in Applied Natural Language Processing	5
CSE 245	Computational Models of Discourse and Dialogue	5
CSE 272	Information Retrieval	5
CSE 290C	Advanced Topics in Machine Learning	5
CSE 290K	Advanced Topics in Natural Language Processing	5

Seminar

Students are encouraged to take the NLP seminar each time it is offered, however a maximum of 2 credits of NLP 280 can be counted toward the 50 credits required for the degree.

All students are required to take the following seminar course at least once (2 credits):

NLP 280	Seminar in Natural Language Processing	2
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Capstone Courses

NLP M.S. students are required to take all three courses in the following capstone series (13 credits):

NLP 271A	Capstone I: Natural Language Processing	3
NLP 271B	Capstone II: Natural Language Processing	5
NLP 271C	Capstone III: Natural Language Processing	5

Transfer Credit

The NLP M.S. program does not accept transfer credit or course substitutions from other institutions. Course substitutions for elective courses taken at UCSC will be considered by petition.

Capstone Requirements

The capstone requirement for the M.S. Degree is fulfilled through an application team project spanning three quarters. Students are expected to form teams and work on their proposals for a capstone project starting in the winter quarter, with refinements, final pitches and initial development during the spring quarter, and completion of the project during the summer. Teams will be made of three to five students, who will work collaboratively on the project.

The teamwork will be spread over a 3-credit class in winter (NLP 271A), a 5-credit class in spring (NLP 271B) and a 5-credit class in summer (NLP 271C) to constitute the complete 13-credit capstone experience. Teams will need to do oral presentations of multiple possible project proposals during the winter quarter. Then after feedback and refinement, these will result in 5-to-10-page written proposals that will be orally presented early in the spring quarter. The proposal will detail the team membership, pitch the topic of the project, and detail the sources of data to be used, which will need to be approved by the capstone coordinator (typically, the executive director of the program). Each team will be supervised by the executive director of the NLP master's program, who will meet with the team at least once a week to provide guidance and evaluate progress. Teams may also have a faculty mentor from among the program faculty and/or an industry mentor.

The evaluation will assess the team's final product, their group process (e.g., the ability to meet deadlines, generate a range of ideas, listen respectfully to disparate perspectives, distribute work fairly, resolve differences, and communicate effectively), and their individual contributions to the final product. Product evaluation will be based on a final written assessment by the faculty or industrial mentor based on the final report and presentation to be presented at the annual Natural Language Processing Fair (see below). Group process evaluation will be based on written team evaluations (in which each member evaluates the dynamics of the group

as a whole) and written evaluations by the mentor produced on weeks 3, 7, and 10 of the summer quarter. Individual evaluations will be based on peer reviews (each team member evaluates the contributions of his/her teammates), self-evaluations (each team member documents and evaluates his own contributions to the team), and an individual 3-page report written by each team member.

All students will be required to either present a poster or oral presentation at the Natural Language Processing Fair, which will be an integral part of the capstone evaluation. The Natural Language Processing Fair will be an annual one-day event taking place at the end of each summer term, which program faculty, students, mentors, and members of the Industry Advisory Board will attend. The fair will also serve as a general outreach to NLP scientists in local industry and government.

Review of Progress

Normative time for completion of the NLP M.S. program is one calendar year (fall, winter, spring, and summer terms). Students are expected to maintain full-time enrollment for the duration of the program and complete all degree requirements within this time frame. Full time enrollment for summer session requires a minimum of 5 credits. All courses, with the exception of the NLP 280 seminar, are offered once per year. If a student fails a core course, they will be required to retake and pass that course the following year when it is offered. If a student fails an elective course, they may make up those credits by passing an additional elective course in a subsequent quarter. Students receiving two or more unsatisfactory grades (U or letter grade below B-) are not making adequate progress and will be recommended for academic probation for up to three quarters of registered enrollment. Should a student fail a course while on academic probation, the department may request the graduate dean to dismiss the student from the graduate program. If after being removed from probation, the student again fails a School of Engineering course, he or she will return immediately to academic probation. Taking a leave of absence does not count as enrollment. Students who have not identified and joined a capstone project team by the end of winter quarter are also considered to not be making adequate progress and will be recommended for academic probation.

Students not making adequate progress toward completion of degree requirements (see the Graduate Student Handbook for policy on satisfactory academic progress) may be recommended for academic probation. Students who violate the terms of their academic probation are subject to dismissal from the program.

Applying for Graduation

All candidates for a degree must submit an Application for the Master's Degree to the Graduate Advising Office by the date stated in the Academic and Administrative Calendar for the quarter you wish to receive the degree. Failure to declare candidacy by the deadline means that you cannot be considered a candidate

until the next term. For more information about applying for graduation, visit the Baskin School of Engineering Graduate Studies website.

HUMAN LANGUAGE MEDIA AND MODELING DESIGNATED EMPHASIS

Introduction

The graduate designated emphasis (DE) leading to the degree notation “with an emphasis in Human-Language Media and Modeling” (HLMM) is a collaboration of faculty from the Departments of Computer Science and Engineering, Linguistics, and Psychology. This DE is administered by the Department of Computer Science and Engineering. Students wishing to complete a master’s thesis or doctoral dissertation in this area must satisfy the degree requirements of a primary program as well as those of the DE. The DE is most suitable for students pursuing degrees in linguistics, computational media, computer science and engineering, and psychology. However, students from any area may work in this interdisciplinary field as long as they meet all requirements, including progress, within the primary degree program.

The current HLMM DE faculty are:

- Pranav Anand, Linguistics
- Jeffrey Flanigan, Computer Science and Engineering
- Jean E. Fox Tree, Psychology
- Marilyn Walker, Computer Science and Engineering
- Yi Zhang, Computer Science and Engineering

Requirements

All students must demonstrate an understanding of human-language media and modeling, through prior work and the completion of a set of HLMM electives or courses.

Committee Composition and Departmental Approvals

The student’s M.S. project or Ph.D. qualifying exam, or Ph.D. committee must include one member of the HLMM faculty.

Course Requirements

All students must complete three 5-credit graduate core courses from the approved list of courses and one 2-credit seminar course and provide evidence of having attended six related seminars or invited talks.

List of Approved Courses

Three 5-credit courses, plus two 2-credit seminars are required, chosen from the list of approved courses:

CSE 240	Artificial Intelligence	5
CSE 245	Computational Models of Discourse and Dialogue	5
CSE 244B	Machine Learning for Natural Language Processing	5
CSE 280Z	Seminar in Natural Language Processing and Dialogue	2
CSE 290K	Advanced Topics in Natural Language Processing	5
CSE 243	Data Mining	5
CSE 272	Information Retrieval	5
STAT 266C	Introduction to Data Wrangling	3

Writing, Research and/or Teaching Requirements

The student’s master’s project, dissertation or thesis must demonstrate knowledge of, and orientation to, research issues related to HLMM.

Proficiency Requirements

All students must demonstrate an understanding of Human-Language Media and Modeling, through prior work and the completion of a set of HLMM electives or courses.

NETWORK AND DIGITAL TECHNOLOGY ELECTIVES COURSE LIST

Network and Digital Technology Electives

Network and Digital Technology Electives Course List

Digital Technology Focus

- CSE 120 Computer Architecture (formerly CMPE 110)
- CSE 121 Microprocessor System Design (formerly CMPE 121/L)*
- CSE 125 Logic Design with Verilog (formerly CMPE 125/L)*
- ECE 101 & ECE 101L Introduction to Electronic Circuits (can be used for elective only if CSE 101 is completed) (formerly EE 101/L)
- ECE 118 Introduction to Mechatronics (formerly CMPE 118/L)

Network Technology Focus

- CSE 101 Abstract Data Types (can be used for elective only if ECE 101/ECE 101L is completed) (formerly CMPS 101)
- CSE 130 Principles of Computer Systems Design (formerly CMPE 105)#
- CSE 151 & CSE 151L Advanced Computer Networks (formerly CMPE 151/L)
- CSE 156 & CSE 156L Network Programming (formerly CMPE 156/L)*

Students can only take either CSE 130 or CSE 131

*These courses are only allowed to be used as electives if not being used for a Capstone.

Capstone Courses

- CSE 115A Introduction to Software Engineering (formerly CMPS 115)
- CSE 121 Microprocessor System Design (formerly CMPE 121/L)
- CSE 125 Logic Design with Verilog (formerly CMPE 125/L)
- ECE 118 Introduction to Mechatronics (formerly CMPE 118/L)
- CSE 156 & CSE 156L Network Programming (formerly CMPE 156/L)

Other Approved Electives

- AM 114 Dynamical Systems (formerly AMS 114)
- AM 147 Computational Methods and Applications (formerly AMS 147)
- AM 231 Nonlinear Control Theory (formerly AMS 231)
- CMPM 146 Game AI
- CSE 102 Analysis of Algorithms (formerly CMPS 102)
- CSE 103 Computational Models (formerly CMPS 130)
- CSE 107 Probability and Statistics for Engineers (formerly CMPE 107)
- CSE 110A Compiler Design I (formerly CMPS 104A)
- CSE 110B Compiler Design II (formerly CMPS 104B)
- CSE 111 Advanced Programming (formerly CMPS 109)

- CSE 112 Comparative Programming Languages (formerly CMPS 112)
- CSE 113 Parallel Programming (formerly CMPS 113)
- CSE 118 Mobile Applications (formerly CMPS 121)
- CSE 132 Computer Security (formerly CMPS 122)
- CSE 138 Distributed Systems: File Sharing, Online Gaming, and More (formerly CMPS 128)
- CSE 139 Data Storage Systems (formerly CMPS 129)
- CSE 140 Artificial Intelligence (formerly CMPS 140)
- CSE 142 Machine Learning (formerly CMPS 142)
- CSE 144 Applied Machine Learning
- CSE 160 & CSE 160L Introduction to Computer Graphics (formerly CMPS 160/L)
- CSE 161 & CSE 161L Introduction to Visualization and Computer Animation (formerly CMPS 161/L)
- CSE 165 Human-Computer Interaction (formerly CMPE 131)
- CSE 167 Mobile Sensing and Interaction (formerly CMPE 161)
- CSE 180 Database Systems I (formerly CMPS 180)
- CSE 181 Database Systems II (formerly CMPS 181)
- CSE 183 Web Applications (formerly CMPS 183)
- CSE 193 Field Study (needs approval that is determined by the department via Course Substitution Petition)
- CSE 198 Independent Study (needs approval that is determined by the department via Course Substitution Petition)
- CSE 276 Optimization Theory and Applications (formerly TIM 206)
- ECE 101 & ECE 101L Intro to Electronic Circuits (only if CSE 101 is completed) (formerly EE 101/L)
- ECE 103 & ECE 103L Signals and Systems (formerly EE 103/L)
- ECE 102 & ECE 102L Properties of Materials (formerly EE 145/L)
- ECE 115 Solid Mechanics (formerly CMPE 115)

- ECE 130 & ECE 130L Introduction to Optoelectronics and Photonics (formerly EE 130/L)
- ECE135 & ECE 135L Electromagnetic Fields and Waves (formerly EE 135/L)
- ECE 136 Engineering Electromagnetics (formerly EE 136)
- ECE 141 Feedback Control Systems (formerly CMPE 141)
- ECE 151 Communications Systems (formerly EE 151)
- ECE 152 Introduction to Wireless Communications (formerly EE 152)
- ECE 153 Digital Signal Processing (formerly CMPE 153)
- ECE 167 & ECE 167L Sensor and Sensor Technologies (formerly CMPE 167/L)
- ECE 171 & ECE 171L Analog Electronics (formerly EE 171/L)
- ECE 172 Advanced Analog Circuits (formerly EE 172)
- ECE 173 & ECE 173L High Speed Digital Design (formerly EE 173/L)
- ECE 175 & ECE 175L Energy Generation and Control (formerly EE 175/L)
- STAT 131 Introduction to Probability Theory (or CSE 107, but not both) (formerly AMS 131)
- CSE 110A Compiler Design I (option for Systems Programming) (formerly CMPS 104A)
- CSE 110B Compiler Design II (formerly CMPS 104B)
- CSE 111 Advanced Programming (option for Computer Systems and Systems Programming) (formerly CMPS 109)
- CSE 112 Comparative Programming Languages (formerly CMPS 112)
- CSE 113 Parallel Programming (option for Systems Programming) (formerly CMPS 113)
- CSE 115A Intro to Software Engineering (option for Computer Systems and Systems Programming) (formerly CMPS 115)
- CSE 118 Mobile Applications (formerly CMPS 121)
- CSE 122 VLSI Digital System Design (option for Computer Systems and Digital Hardware) (formerly CMPE 122)
- CSE 125 Logic Design with Verilog (option for Computer Systems; required for Digital Hardware) (formerly CMPE 125/L)
- CSE 131 Introduction to Operating Systems (required for Computer Systems, Networks and Systems Programming) (formerly CMPS 111)
- CSE 132 Computer Security (formerly CMPS 122)
- CSE 134 Embedded Operating System
- CSE 138 Distributed Systems: File Sharing, Online Gaming, and More (formerly CMPS 128)
- CSE 139 Data Storage Systems (formerly CMPS 129)
- CSE 140 Artificial Intelligence (formerly CMPS 140)
- CSE 144 Applied Machine Learning
- CSE 142 Machine Learning (formerly CMPS 142)
- CSE 150/CSE 150L Intro to Computer Networks (required for Networks and Systems Programming) (formerly CMPE 150/L)
- CSE 151/CSE 151L Advanced Computer Networks (option for Networks) (formerly CMPE 151/L)
- CSE 156/CSE 156L Network Programming (required for Networks) (formerly CMPE 156/L)
- CSE 160/CSE 160L Introduction to Computer Graphics (formerly CMPS 160/L)

COMPUTER SCIENCE AND ENGINEERING COURSE LISTS

Computer Engineering Electives

Requirements List with Courses

(The courses listed here will satisfy the requirement for any box marked "Elective" on the Computer Engineering Chart. If you are looking for the Robotics & Control Elective list please go here.)

- AM 114 Dynamical Systems (formerly AMS 114)
- AM 147 Computational Methods and Applications (formerly AMS 147)
- CMPM 146 Game AI
- CSE 102 Analysis of Algorithms (formerly CMPS 102)
- CSE 103 Computational Models (formerly CMPS 130)

- CSE 161/CSE 161L Introduction to Visualization and Computer Animation (formerly CMPS 161/L)
- CSE 165 Human-Computer Interaction (formerly CMPE 131)
- CSE 167 Mobile Sensing and Interaction (formerly CMPE 161)
- CSE 180 Database Systems I (formerly CMPS 180)
- CSE 181 Database Systems II (formerly CMPS 181)
- CSE 183 Hypermedia and the Web (formerly CMPS 183)
- CSE 193 Field Study (must file Course Substitution, Approval on a case by case basis)
- CSE 198 Independent Study (must file Course Substitution, Approval on a case by case basis)
- CSE 220 Computer Architecture (formerly CMPE 202)
- CSE 222A VLSI Digital System Design (formerly CMPE 222)
- CSE 276 Optimization Theory and Applications (formerly TIM 206)
- ECE 102/ECE 102L Properties of Materials (formerly EE 145/L)
- ECE 115 Solid Mechanics (formerly CMPE 115)
- ECE 118 Intro to Mechatronics (formerly CMPE 118/L)
- ECE 130/ECE 130L Introduction to Optoelectronics and Photonics (formerly EE 130/L)
- ECE 135/ECE 135L Electromagnetic Fields and Waves (formerly EE 135/L)
- ECE 141 Feedback Control Systems (formerly CMPE 141)
- ECE 151 Communications Systems (formerly EE 151)
- ECE 152 Introduction to Wireless Communications (formerly EE 152)
- ECE 153 Digital Signal Processing (formerly CMPE 153)
- ECE 167/ECE 167L Sensor and Sensor Technologies (option for Robotics and Control) (formerly CMPE 167/L)
- ECE 171/ECE 171L Analog Electronics (required for Digital Hardware) (formerly EE 171/L)

- ECE 172 Advanced Analog Circuits (formerly EE 172)
- ECE 173/ECE 173L High Speed Digital Design (option for Digital Hardware) (formerly EE 173/L)
- ECE 175/ECE 175L Energy Generation and Control (formerly EE 175/L)

COMPUTER ENGINEERING B.S. DIGITAL HARDWARE CONCENTRATION GRAD- LEVEL COURSE LIST

Computer Engineering B.S. Digital Hardware Concentration Grad-Level Course List

Computer Engineering B.S. Digital Hardware Concentration Grad-Level Course List

CSE 207	Graph Algorithms	5
CSE 220	Computer Architecture	5
CSE 221	Advanced Microprocessor Design	5
CSE 222A	VLSI Digital System Design	5
CSE 222B	VLSI System-on-a-Chip Design	5
CSE 225	Introduction to ASIC Systems Design	7
CSE 226	Advanced Parallel Processing	5
CSE 229	Field-Programmable Gate Arrays Computer-Assisted Design	5
CSE 234	Understanding Cryptography	5
CSE 250A	Computer Networks	5
CSE 250B	Principles of Computer Communication	5
CSE 250C	High Speed Computer Networks	5
CSE 253	Network Security	5
CSE 257	Wireless and Mobile Networks	5
CSE 259	Sensor Networks	5
CSE 264	Computer Vision	5
CSE 265	Human-Computer Interaction	5
ECE 215	Models of Robotic Manipulation	5
ECE 216	Bio-Inspired Locomotion	5
ECE 218	Mechatronics	10
ECE 240	Introduction to Linear Dynamical Systems	5
ECE 241	Introduction to Feedback Control Systems	5
ECE 242	Applied Feedback Control	5
ECE 244	Digital Control	5
ECE 245	Estimation and Introduction to Control of Stochastic Processes	5

ECE 246	Hybrid Dynamical Systems	5
ECE 249	Introduction to Cyber-physical Systems	5

Electrical and Computer Engineering

Baskin School of Engineering
(831) 459-2158
<https://www.soe.ucsc.edu/departments/electrical-computer-engineering>

PROGRAMS OFFERED

Electrical Engineering B.S. (p. 508)

Robotics Engineering B.S. (p. 514)

Electrical Engineering Minor (p. 519)

Assistive Technology Minor (p. 521)

Boeconomics and Biophotonics Minor (p. 522)

Electrical and Computer Engineering Contiguous Bachelor's/Master's Pathway (p. 523)

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Electrical and Computer Engineering Ph.D. (p. 526)

Robotics and Control Designated Emphasis (p. 529)

The Electrical and Computer Engineering Department at UC Santa Cruz aims to achieve engineering discoveries that benefit humankind through a combination of curiosity, open-mindedness, and inclusiveness. We aim to provide undergraduate and graduate students with inspiration and quality education, believing that rigor, creativity, and excitement should be part of the Electrical and Computer Engineering curriculum. Our Electrical Engineering undergraduate program is ABET accredited.

UNDERGRADUATE PROGRAM

The Electrical and Computer Engineering Department's undergraduate program offers bachelor of science degrees for students majoring in electrical engineering and robotics engineering. The electrical engineering B.S. degree is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>. Minors are also offered in electrical engineering, bioelectronics and biophotonics, and assistive technology.

The department emphasizes teaching excellence, opportunities for students to engage in research with our faculty, and preparation for industrial professional practice through yearlong interdisciplinary team-based capstone projects. Students primarily intending to pursue graduate study research can choose the thesis option instead of the capstone sequence.

For more details, visit the Electrical and Computer Engineering Department website and the department's program statements in the catalog.

GRADUATE PROGRAM

The Department of Electrical and Computer Engineering (ECE) at the University of California, Santa Cruz (UCSC) offers master of science (M.S.) and doctor of philosophy (Ph.D.) degree programs and conducts research in the following core areas:

- Electronic Circuits and Energy Systems
- Photonic and Electronic Devices
- Robotics, Control, and Cyber-Physical Systems
- Signals, Image Processing, and Communication Systems

For more information about the core areas and associated graduate courses, the department, and its faculty, please visit the Electrical and Computer Engineering Department website and the respective program statements in the catalog.

ELECTRICAL ENGINEERING B.S.

Information and Policies

Introduction

The electrical engineering B.S. program is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>.

Students can pursue either of two concentrations, Electronics/Optics or Communications, Signals and Systems.

Academic Advising for the Program

The Baskin School of Engineering undergraduate advising office offers general advising for prospective and declared undergraduates majoring in School of Engineering programs. The office handles major declarations, transfer credits, course substitutions, articulations, and degree certifications.

Transfer students should also refer to the Transfer Information and Policy section.

Baskin Engineering Building, Room 225
bsoe advising@ucsc.edu
(831) 459-5840

Getting Started in the Major

For the first two years, all electrical engineering students are expected to take a basic set of lower-division mathematics, physical science, and engineering courses. After the first two years, electrical engineering students focus on topics within the discipline and specialize in one of two options: electronics/optics, including digital and analog circuits and devices, VLSI design, optoelectronics, electromagnetics, power engineering, and biomedical device engineering; or communications, signals, systems,

and control, including optical, wireless communication, signal and image processing, networks signal processing, instrumentation, and control.

Program Learning Outcomes

Program Educational Objectives:

Program Educational Objectives (PEOs) are based on the needs of the Electrical Engineering program constituents. They describe what graduates are expected to attain within a few years after graduation.

The PEOs for the Electrical Engineering program at UCSC are as follows:

1. **Advanced Learning and Professional Development:** Achieve a high quality, professional approach to engineering through a desire for advanced education, lifelong learning and participation in the professional engineering community.
2. **Adaptation to Technological Change:** Enjoy a successful professional career in a world with rapid technological change by having a sound foundation in the fundamental electrical engineering theory, design and basic science upon which future technology will be based.
3. **Skills for Initial and Continued Employment Success:** Demonstrate job-relevant electrical engineering skills through theoretical and practical competence in hardware and information oriented electrical engineering, as well as independence in thought and action.
4. **Leadership, Teamwork and Entrepreneurial Skills:** Achieve a high level of individual creativity for personal achievement as well as the interpersonal, communications and responsibility skills for creating an effective team project environment, including an ability to apply engineering competence in both research and product oriented settings.
5. **Ethics and Societal Issues:** Practice a high standard of professional ethics and have a positive impact on the social and environmental aspects of engineering design and implementation.

Student Outcomes:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences

4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Major Qualification Policy and Declaration Process

Major Qualification

Admission to the electrical engineering major is selective. In order to be admitted into the electrical engineering major students must be listed as a proposed major within the School of Engineering, and complete all the foundation courses listed below with a GPA of 2.8 or better.

Please refer to the School of Engineering's "Proposed Major Retention" and its "Declaring a School of Engineering Major" sections in the catalog or the School of Engineering's information on declaring a major for more information.

Transfer students should also refer to the Transfer Information and Policy section.

Both of the following

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

Plus one of the following courses

AM 10	Mathematical Methods for Engineers I	5
MATH 21	Linear Algebra	5

Plus one of the following courses

AM 20	Mathematical Methods for Engineers II	5
MATH 24	Ordinary Differential Equations	5

Plus all the following courses

PHYS 5A	Introduction to Physics I	5
PHYS 5L	Introduction to Physics I Laboratory	1
PHYS 5B	Introduction to Physics II	5
PHYS 5M	Introduction to Physics II Laboratory	1

PHYS 5C	Introduction to Physics III	5
PHYS 5N	Introduction to Physics Laboratory III	1

Additionally

Students must complete an "Introduction to Engineering" class, chosen from the following courses:

ECE 80T	Modern Electronic Technology and How It Works	5
CSE 80C	Starting a New Technology Company	5

ECE 80T is recommended.

Appeal Process

Students who are informed that they are not eligible to declare may appeal this decision by submitting a letter to the undergraduate director within 15 days from the date the notification was mailed. Within 15 days of receipt of the appeal, the department will notify the student, the college, and the Office of the Registrar of the decision.

If you have further questions concerning the appeal process, please contact the Undergraduate Advising Office at (831) 459-5840 or email bsoeadvising@ucsc.edu.

More information regarding the appeal process can be found on the BSOE Major Declaration Appeal Process page.

How to Declare a Major

Instructions for declaring a major in the Baskin School of Engineering are on the BSOE Undergraduate Affairs Declare your Major page.

Transfer Information and Policy**Transfer Admission Screening Policy**

The following courses or their equivalents are required prior to transfer, by the end of spring term for students planning to enter in the fall.

First-year calculus

Both:

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

Linear algebra

One of:

AM 10	Mathematical Methods for Engineers I	5
MATH 21	Linear Algebra	5

Differential equations

One of:

AM 20	Mathematical Methods for Engineers II	5
MATH 24	Ordinary Differential Equations	5

Calculus-based physics

A year of calculus-based physics courses accepted as equivalent to:

PHYS 5A	Introduction to Physics I	5
PHYS 5L	Introduction to Physics I Laboratory	1
PHYS 5B	Introduction to Physics II	5
PHYS 5M	Introduction to Physics II Laboratory	1
PHYS 5C	Introduction to Physics III	5
PHYS 5N	Introduction to Physics Laboratory III	1

Cumulative GPA

A minimum GPA of 2.8 must be obtained in the courses listed above.

Additionally

In addition, the following courses are recommended prior to transfer to ensure timely graduation.

CSE 12	Computer Systems and Assembly Language	5
MATH 23A	Vector Calculus	5

and one of the following courses:

ECE 13	Computer Systems and C Programming	7
PHYS 5D	Introduction to Physics IV	5
MATH 23B	Vector Calculus	5

General Education Options

Prospective students are encouraged to prioritize required and recommended major preparation prior to transfer, and may additionally complete courses that articulate to UC Santa Cruz general education requirements as time allows.

Getting Started at UCSC as a Transfer Student

Transfer students should declare their major in their first quarter at UCSC. Instructions for declaring a major in the Baskin School of Engineering are on the Declare Your Major page.

Letter Grade Policy

The Electrical and Computer Engineering Department requires letter grading for all courses applied toward the bachelor of science (B.S.) degree.

[Optional Catchall]**Course Substitution Policy**

Please refer to the School of Engineering section of the catalog (p. 408) for the policy regarding course substitution.

Double Majors and Major/Minor Combinations Policy**Study Abroad****Honors**

Electrical engineering majors are considered for “Honors in the Major” and “Highest Honors in the Major” based on the GPA and on results of undergraduate research and other significant contributions to the School of Engineering. Students with a GPA of 3.7 or higher receive highest honors. Students with a GPA of 3.3 or higher but less than 3.7, receive honors. A student meeting the GPA requirement for highest honors or honors may not receive honors if a student has been found guilty of academic misconduct. Students with particularly significant accomplishments in undergraduate research or contributions to the School of Engineering may be considered with a lower GPA. Electrical engineering juniors and seniors may also be eligible for election to the UCSC chapter of Tau Beta Pi, the national engineering honor society founded in 1885.

Materials Fee and Miscellaneous Fees

Please see the section on fees under the School of Engineering.

[Optional Catchall]**Requirements and Planners****Course Requirements (all concentrations)****Lower-Division Courses**

Students gain a solid foundation in calculus, engineering mathematics, physics, computer science, and computer engineering during their first two years. Majors must complete the following 13 lower-division courses (including corresponding laboratories). These courses form part of the prerequisite sequence and should be completed during the first two years at UC Santa Cruz. The requirements are rigorous; students must be prepared to begin these courses early in their studies.

Electrical and Computer Engineering

ECE 80T	Modern Electronic Technology and How It Works	5
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This course is waived for transfer students.

Computer Science and Engineering

All of the following courses:

CSE 12	Computer Systems and Assembly Language	5
ECE 13	Computer Systems and C Programming	7

Mathematics

All of the following:

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 23A	Vector Calculus	5
MATH 23B	Vector Calculus	5

Applied Mathematics**One of the following**

AM 10	Mathematical Methods for Engineers I	5
MATH 21	Linear Algebra	5

Plus one of the following

AM 20	Mathematical Methods for Engineers II	5
MATH 24	Ordinary Differential Equations	5

Physics

All of the following:

PHYS 5A	Introduction to Physics I	5
PHYS 5L	Introduction to Physics I Laboratory	1
PHYS 5B	Introduction to Physics II	5
PHYS 5M	Introduction to Physics II Laboratory	1
PHYS 5C	Introduction to Physics III	5
PHYS 5N	Introduction to Physics Laboratory III	1
PHYS 5D	Introduction to Physics IV	5

Upper-Division Courses

Fifteen upper-division courses along with associated 1- or 2-credit laboratories are required for the major. The course requirements include both depth and breadth, technical writing, and a comprehensive capstone design project.

All students are required to take the following eight upper-division courses, with associated laboratories.

Electrical and Computer Engineering

ECE 101	Introduction to Electronic Circuits	5
ECE 101L	Introduction to Electronic Circuits Laboratory	2
ECE 102	Properties of Materials	5
ECE 102L	Properties of Materials Laboratory	2
ECE 103	Signals and Systems	5

ECE 103L	Signals and Systems Laboratory	2
ECE 135	Electromagnetic Fields and Waves	5
ECE 135L	Electromagnetic Fields and Waves Laboratory	2
ECE 151	Communications Systems	5
ECE 171	Analog Electronics	5
ECE 171L	Analog Electronics Laboratory	2

Computer Science and Engineering

CSE 100	Logic Design	5
CSE 100L	Logic Design Laboratory	2

Statistics

STAT 131	Introduction to Probability Theory	5
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Lecture/lab combinations count as one course.

Electives

In addition to completing the courses required for both concentrations, electrical engineering majors must complete four elective courses chosen from the lists below. Students pursuing the Electronics/Optics concentration must choose at least three courses from the Electronics/Optics courses listed below. Students pursuing the Communications, Signals and Systems concentration must choose at least three courses from the Communication and Signals courses listed below.

Certain graduate-level courses as well as those courses taught in conjunction with graduate courses may also be used to fulfill an elective requirement as listed below. No course may be counted twice. See the electrical engineering website for course descriptions.

Design Elective: One of the four concentration courses chosen must include at least one of the following design electives ECE 118 & ECE 118L, ECE 157 & ECE 157L, ECE 121, and ECE 173 & ECE 173L . This course must be taken before the first capstone course ECE 129A.

Electronics/Optics Concentration Courses

Electrical and Computer Engineering

ECE 104	Bioelectronics	5
ECE 115	Introduction to Solid Mechanics	5
ECE 118	Introduction to Mechatronics	10
ECE 121	Microcontroller System Design	7
ECE 130	Introduction to Optoelectronics and Photonics	5
ECE 130L	Introduction to Optoelectronics Laboratory	1
ECE 230	Optical Fiber Communication	5
ECE 136	Engineering Electromagnetics	5

ECE 141	Feedback Control Systems	5
ECE 241	Introduction to Feedback Control Systems	5
ECE 157	RF Hardware Design	5
ECE 157L	RF Hardware Design Laboratory	2
ECE 167	Sensing and Sensor Technologies	7
ECE 172	Advanced Analog Circuits	5
ECE 221	Advanced Analog Integrated Circuits	5
ECE 173	High-Speed Digital Design	5
ECE 173L	High-Speed Digital Design Laboratory	2
ECE 175	Energy Generation and Control	5
ECE 175L	Energy Generation and Control Laboratory	2
ECE 176	Energy Conservation and Control	5
ECE 176L	Energy Conversion and Control Laboratory	2
ECE 177	Power Electronics	5
ECE 177L	Power Electronics Laboratory	2
ECE 178	Device Electronics	5
ECE 180J	Advanced Renewable Energy Sources, Storage, and Smart Grids	5
ECE 201	Introduction to Nanotechnology	5
ECE 203	Nanocharacterization of Materials	5
ECE 231	Optical Electronics	5

Lecture/lab combinations count as one course.

(ECE 130 and ECE 230, ECE 141 and ECE 241, and ECE 172 and ECE 221 are undergraduate and graduate courses taught in conjunction, and only one can be taken for this program.)

Communications, Signals, Systems Concentration Courses

Electrical and Computer Engineering

Lecture/lab combination count as one course.

ECE 118	Introduction to Mechatronics	10
ECE 130	Introduction to Optoelectronics and Photonics	5
ECE 130L	Introduction to Optoelectronics Laboratory	1

ECE 230	Optical Fiber Communication	5
ECE 136	Engineering Electromagnetics	5
ECE 141	Feedback Control Systems	5
ECE 241	Introduction to Feedback Control Systems	5
ECE 152	Introduction to Wireless Communications	5
ECE 252	Wireless Communications	5
ECE 153	Digital Signal Processing	5
ECE 250	Digital Signal Processing	5
ECE 237	Image Processing and Reconstruction	5
ECE 251	Principles of Digital Communications	5
ECE 253	Introduction to Information Theory	5
ECE 255	Error Control Coding	5
ECE 256	Statistical Signal Processing	5

Computer Science and Engineering

CSE 150	Introduction to Computer Networks	5
CSE 150L	Introduction to Computer Networks Laboratory	2

Lecture lab combinations count as one course.

(ECE 130 and ECE 230, ECE 152 and ECE 252, ECE 141 and ECE 241, and ECE 153 and ECE 250 are undergraduate and graduate courses taught in conjunction, and only one can be taken for this program.)

Disciplinary Communication (DC) Requirement

Students in all majors must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement is satisfied by completing the senior capstone course sequence:

Either these three courses:

ECE 129A	Capstone Project I	5
ECE 129B	Capstone Project II	5
ECE 129C	Capstone Project III	5

Or these two courses:

ECE 129A	Capstone Project I	5
ECE 195	Senior Thesis Research	5

10 credits for the senior thesis course, ECE 195, must be completed for this option.

Comprehensive Requirement

The senior comprehensive requirement for electrical engineering majors is in two parts: a project course and assessment options.

Project Course

These senior-level courses encompass an in-depth project, including analysis, design, testing, and documentation, requiring students to call upon knowledge acquired throughout their undergraduate studies. Students

must complete one capstone design course that spans three quarters. Current course choices include the following:

ECE 129A	Capstone Project I	5
ECE 129B	Capstone Project II	5

Or complete the following courses:

ECE 129A	Capstone Project I	5
ECE 195	Senior Thesis Research	5

10 credits for the senior thesis course, ECE 195, must be completed for this option.

Outcomes Assessment Options

The Electrical and Computer Engineering Department requires an outcomes assessment. All students are required to complete an exit survey and meet with a faculty member for an exit interview. The specifics of the outcomes assessment may change from year to year; for this catalog year, students must also complete one of the following options:

1. maintenance of a 2.5 grade point average in all required and elective courses for the major; or
2. senior thesis submission; or
3. portfolio review.

Portfolios must include the following:

- project report(s)
- a one- or two-page overview of the student's contribution to the project(s);
- a two-page essay concerning the relationship of engineering to society (specific topics will be provided by the Electrical and Computer Engineering Department).

The portfolios must be submitted electronically at least seven days before the end of the instruction in the quarter of graduation. Portfolios will not be returned.

Planners

The following is a sample academic plan for incoming first-year students. Students who are unable to follow this planner should consult with ECE advisors for alternatives. Transfer students should seek advisement as their plans will vary depending on their lower-division courses.

Plan for Entering Frosh

	Fall	Winter	Spring
1st (frosh)	MATH 19A	MATH 19B	AM 10
	CSE 12	PHYS 5A & PHYS 5L	PHYS 5B & PHYS 5M
		ECE 80T	ECE 13

2nd (soph)	MATH 23A	ECE 101 & ECE 101L	MATH 23B	102L		
	CSE 100 & CSE 100L	AM 20	ECE 103 & ECE 103L	Upper- division elective	Upper- division elective	Upper-division elective
	PHYS 5C & PHYS 5N	PHYS 5D				
3rd (junior)	STAT 131	Design elective	Upper- division elective			
	ECE 171 & ECE 171L	ECE 151	ECE 135 & ECE 135L			
4th (senior)	ECE 129A	ECE 129B	ECE 129C			
	ECE 102 & ECE 102L	Upper-division elective	Upper- division elective			

*This planner assumes that transfer students have completed all of their lower-division courses except two out of the three courses PHYS 5D, MATH 23B, and ECE 13 prior to attending UCSC. Transfer students are encouraged to minimally complete ECE 13 before entering UCSC or during the summer quarter preceding their entry to UCSC.

Three of the four electives must be taken in the student's concentration.

Curriculum charts for all BSOE majors are available at the department's Major Curriculum Charts page.

Additional information about this program can be found on the department's website.

ROBOTICS ENGINEERING B.S.

Information and Policies

Introduction

Academic Advising for the Program

The Baskin School of Engineering Undergraduate Advising office offers general advising for prospective and declared undergraduates majoring in School of Engineering programs. The office handles major declarations, transfer credits, course substitutions, articulations, and degree certifications.

Transfer students should also refer to the Transfer Information and Policy section.

Baskin Engineering Building, Room 225
 bsoeadvising@ucsc.edu
 (831) 459-5840

Getting Started in the Major

Program Learning Outcomes

Student Outcomes

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences

Three of the four electives must be taken in the student's concentration.

In addition to the specific courses shown in the planner above, a student must complete courses satisfying the

CC, ER, IM, TA and PE general education requirements.

Plan for Junior Transfer Students*

	Fall	Winter	Spring
1st (junior)	ECE 101 & ECE 101L	ECE 171 & ECE 171L	ECE 103 & ECE 103L
	CSE 100 & CSE 100L	STAT 131	Design elective
	PHYS 5D or MATH 23B	ECE 13 or MATH 23B	
2nd (senior)	ECE 129A	ECE 129B	ECE 129C
	ECE 102 & ECE	ECE 151	ECE 135 & ECE 135L

4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

ECE 9	Statics and Mechanics of Materials	5
CSE 12	Computer Systems and Assembly Language	5
CSE 12L	Computer Systems and Assembly Language Laboratory	2
CSE 16	Applied Discrete Mathematics	5
CSE 30	Programming Abstractions: Python	7
ECE 13	Computer Systems and C Programming	7
PHYS 5A	Introduction to Physics I	5
PHYS 5L	Introduction to Physics I Laboratory	1
PHYS 5C	Introduction to Physics III	5
PHYS 5N	Introduction to Physics Laboratory III	1

Major Qualification Policy and Declaration Process

Major Qualification

In order to be admitted into the robotics engineering major students must be listed as a proposed major within the School of Engineering. Students in the engineering and computing cluster must propose a School of Engineering major before they can declare. Please refer to the School of Engineering's "Proposed Major Retention" and its "Declaring a School of Engineering Major" sections in the catalog or the BSOE Undergraduate Affairs Prepare to Declare page for more information.

Transfer students should also refer to the Transfer Information and Policy.

In addition to being listed as a proposed School of Engineering major, declaration of the robotics engineering major in the first six quarters of enrollment at UC Santa Cruz is based on performance in the following lower-division courses and associated labs required for the major:

Both of these

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

And one of these (whichever is completed first)

AM 30	Multivariate Calculus for Engineers	5
MATH 23A	Vector Calculus	5

And one of these (whichever is completed first):

AM 10	Mathematical Methods for Engineers I	5
MATH 21	Linear Algebra	5

And all of these:

AM 20	Mathematical Methods for Engineers II	5
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Appeal Process

Students who are informed that they are not eligible to declare may appeal this decision by submitting a letter to the undergraduate director within 15 days from the date the notification was mailed. Within 15 days of receipt of the appeal, the department will notify the student, the college, and the Office of the Registrar of the decision.

If you have further questions concerning the appeal process, please contact the Undergraduate Advising Office at (831) 459-5840 or email bsoadvising@ucsc.edu.

More information regarding the appeal process can be found on the BSOE Undergraduate Affairs Appeal Your Major page.

How to Declare a Major

Instructions for declaring a major in the Baskin School of Engineering are on the school's Declare Your Major page.

Transfer Information and Policy

Transfer Admission Screening Policy

The following courses or their equivalents, are required prior to transfer by the end of spring term for students planning to enter in the fall.

First-year calculus

Both:		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

Linear Algebra

One of:			
AM 10	Mathematical Methods for Engineers I	5	
MATH 21	Linear Algebra	5	

Differential equations

One of:			
AM 20	Mathematical Methods for Engineers II	5	
MATH 24	Ordinary Differential Equations	5	

Calculus-based physics

Two quarters of calculus-based physics courses accepted as equivalent to:

PHYS 5A	Introduction to Physics I	5	
PHYS 5L	Introduction to Physics I Laboratory	1	
PHYS 5C	Introduction to Physics III	5	
PHYS 5N	Introduction to Physics Laboratory III	1	

Cumulative GPA

A minimum GPA of 2.8 must be obtained in the courses listed above.

Additionally

In addition, the following courses are recommended prior to transfer to ensure timely graduation.

CSE 12	Computer Systems and Assembly Language	5	
CSE 12L	Computer Systems and Assembly Language Laboratory	2	
MATH 23A	Vector Calculus	5	
CSE 16	Applied Discrete Mathematics	5	
CSE 20	Beginning Programming in Python	5	
CSE 30	Programming Abstractions: Python	7	
ECE 13	Computer Systems and C Programming	7	

Also, CSE 12/CSE 12L, CSE 16, CSE 101, ECE 9, ECE 10, ECE 13, and MATH 23A and many general education requirements may be offered by UCSC Summer Session and taken prior to starting the first fall quarter at UCSC.

Getting Started at UCSC as a Transfer Student

Transfer students should declare their major in their first quarter at UC Santa Cruz. Instructions for declaring a major in the Baskin School of Engineering are on the Declare Your Major page.

Letter Grade Policy

The Electrical and Computer Engineering Department requires letter grading for all courses applied toward the B.S. in robotics engineering. This policy includes courses required for the degree that are sponsored by other departments.

[Optional Catchall]**Course Substitution Policy**

Please refer to the School of Engineering section of the catalog (p. 408) for the policy regarding course substitution.

Double Majors and Major/Minor Combinations Policy

Students completing this major cannot also receive the computer engineering minor or the network and digital technology B.A. degree. They can only receive the computer engineering B.S. in a concentration other than robotics and control.

Study Abroad**Honors**

Majors are considered for “Honors in the Major” and “Highest Honors in the Major” based on their GPA and on results of undergraduate research and other significant contributions to the School of Engineering. Students with a GPA of 3.7 or higher, in most cases, receive highest honors. Students with a GPA of 3.3 or higher but less than 3.7, in most cases, receive honors. Students with particularly significant accomplishments in undergraduate research or contributions to the School of Engineering may be considered with a lower GPA. Robotics engineering juniors and seniors may also be eligible for election to the UC Santa Cruz chapter of Tau Beta Pi, the national engineering honor society founded in 1885.

School of Engineering Policies

Please refer to the School of Engineering section of the catalog (p. 408) for additional policies that apply to all School of Engineering programs.

Materials Fee and Miscellaneous Fees

Please see the section on fees under the School of Engineering (p. 408).

[Optional Catchall]**Requirements and Planners****Course Requirements**

All students in the robotics engineering major must take the courses listed below. Although not required, it is strongly recommended that students interested in the robotics engineering major take ECE 8, Introduction to Robot Automation, in their first quarter. The senior comprehensive requirement for robotics engineering

majors is satisfied by completion of the capstone course and the portfolio exit requirement. Students not making sufficient progress in the major may be recommended to change to another major.

Lower-Division Courses

Students who may have originally pursued another major should discuss with the Baskin School of Engineering Undergraduate Advising office whether or not already completed coursework may be substituted for one or more lower-division requirements.

Either of the following:

AM 10	Mathematical Methods for Engineers I	5
MATH 21	Linear Algebra	5

And all the following:

AM 20	Mathematical Methods for Engineers II	5
CSE 12	Computer Systems and Assembly Language	5
CSE 12L	Computer Systems and Assembly Language Laboratory	2

And the following:

CSE 20	Beginning Programming in Python	5
CSE 30	Programming Abstractions: Python	7

Students with no prior programming will take CSE 20 before CSE 30. Students with a prior programming course, AP credit, or clearing the “Test-out” bar will start with CSE 30.

And either of the following:

MATH 23A	Vector Calculus	5
AM 30	Multivariate Calculus for Engineers	5

And all the following courses:

ECE 13	Computer Systems and C Programming	7
CSE 16	Applied Discrete Mathematics	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
PHYS 5A	Introduction to Physics I	5
PHYS 5L	Introduction to Physics I Laboratory	1
PHYS 5C	Introduction to Physics III	5
PHYS 5N	Introduction to Physics Laboratory III	1
ECE 9	Statics and Mechanics of Materials	5
ECE 10	Fundamentals of Robot Kinematics and Dynamics	5

Upper-Division Courses

All of the following:

CSE 100	Logic Design	5
CSE 100L	Logic Design Laboratory	2
CSE 107	Probability and Statistics for Engineers	5
ECE 141	Feedback Control Systems	5
ECE 167	Sensing and Sensor Technologies	7
ECE 167L	Sensing and Sensor Technologies Lab	2
CSE 101	Introduction to Data Structures and Algorithms	5
ECE 101	Introduction to Electronic Circuits	5
ECE 101L	Introduction to Electronic Circuits Laboratory	2
ECE 103	Signals and Systems	5
ECE 103L	Signals and Systems Laboratory	2
ECE 118	Introduction to Mechatronics	10
ECE 118L	Introduction to Mechatronics Laboratory	2
ECE 121	Microcontroller System Design	7

Electives

Advanced Robotics Elective

One of the following:

ECE 215	Models of Robotic Manipulation	5
ECE 216	Bio-Inspired Locomotion	5
ECE 240	Introduction to Linear Dynamical Systems	5
ECE 242	Applied Feedback Control	5
ECE 244	Digital Control	5
ECE 245	Estimation and Introduction to Control of Stochastic Processes	5
ECE 246	Hybrid Dynamical Systems	5
ECE 249	Introduction to Cyber-physical Systems	5

Upper-Division and Graduate Elective

One course from the following:

AM 114	Introduction to Dynamical Systems	5
ECE 145	Estimation and Introduction to Control of Stochastic Processes	5
AM 147	Computational Methods and Applications	5
CMPM 146	Game AI	5
CSE 120	Computer Architecture	5

CSE 113	Parallel and Concurrent Programming	5	ECE 135	Electromagnetic Fields and Waves	5
CSE 122	Introduction to VLSI Digital System Design	5	ECE 135L	Electromagnetic Fields and Waves Laboratory	2
CSE 125	Logic Design with Verilog	5	ECE 102	Properties of Materials	5
CSE 125L	Logic Design with Verilog Laboratory	2	ECE 102L	Properties of Materials Laboratory	2
CSE 165	Human-Computer Interaction	5	ECE 151	Communications Systems	5
CSE 150	Introduction to Computer Networks	5	ECE 152	Introduction to Wireless Communications	5
CSE 150L	Introduction to Computer Networks Laboratory	2	ECE 153	Digital Signal Processing	5
CSE 151	Advanced Computer Networks	5	ECE 171	Analog Electronics	5
CSE 151L	Advanced Computer Networks Laboratory	2	ECE 171L	Analog Electronics Laboratory	2
ECE 153	Digital Signal Processing	5	ECE 172	Advanced Analog Circuits	5
CSE 156	Network Programming	5	ECE 173	High-Speed Digital Design	5
CSE 156L	Network Programming Laboratory	2	ECE 173L	High-Speed Digital Design Laboratory	2
CSE 167	Mobile Sensing and Interaction	5	ECE 175	Energy Generation and Control	5
CSE 106	Applied Graph Theory and Algorithms	5	ECE 175L	Energy Generation and Control Laboratory	2
CSE 102	Introduction to Analysis of Algorithms	5	ECE 193	Field Study	5
CSE 110A	Fundamentals of Compiler Design I	5	ECE 198	Individual Study or Research	5
CSE 110B	Fundamentals of Compiler Design II	5	CSE 276	Optimization Theory and Applications	5
CSE 111	Advanced Programming	5			
CSE 131	Introduction to Operating Systems	5			
CSE 112	Comparative Programming Languages	5			
CSE 115A	Introduction to Software Engineering	5			
CSE 118	Mobile Applications	5			
CSE 132	Computer Security	5			
CSE 138	Distributed Systems	5			
CSE 139	Data Storage Systems	5			
CSE 103	Computational Models	5			
CSE 140	Artificial Intelligence	5			
CSE 142	Machine Learning	5			
CSE 160	Introduction to Computer Graphics	5			
CSE 160L	Introduction to Computer Graphics Laboratory	2			
CSE 161	Introduction to Data Visualization	5			
CSE 161L	Data Visualization Laboratory	2			
CSE 180	Database Systems I	5			
CSE 181	Database Systems II	5			
CSE 183	Web Applications	5			
ECE 130	Introduction to Optoelectronics and Photonics	5			
ECE 130L	Introduction to Optoelectronics Laboratory	1			

Lecture and required concurrent lab course counts as one course.

Disciplinary Communication (DC) Requirement

Students in all majors must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement in robotics is satisfied by completing the senior capstone course sequence:

Either these three courses:

ECE 129A	Capstone Project I	5
ECE 129B	Capstone Project II	5
ECE 129C	Capstone Project III	5

Or these two courses:

ECE 129A	Capstone Project I	5
ECE 195	Senior Thesis Research	5

10 credits for the senior thesis course, ECE 195, must be completed for this option.

Comprehensive Requirement

Capstone Requirement

Students must complete one capstone design course that spans three quarters

ECE 129A	Capstone Project I	5
ECE 129B	Capstone Project II	5
ECE 129C	Capstone Project III	5

or complete the following courses:

ECE 129A	Capstone Project I	5
ECE 195	Senior Thesis Research	5

10 credits for the senior thesis course, ECE 195, must be completed for this option.

Exit Requirement

Students are required to complete an exit survey and attend an exit interview. Portfolios of the students work will be collected from our courses for program evaluation. The portfolios will be reviewed by the Electrical and Computer Engineering undergraduate committee and will include two project reports: ECE 118 & ECE 118L and either the senior capstone report (ECE 129A/ECE 129B/ECE 129C) or the student's senior thesis.

Planners

Four-Year Planner for Robotics Engineering

Below is a sample academic plan for students majoring in robotics engineering. As part of the major declaration process students prepare an academic plan and the selected electives may affect the placement of other courses as well. Careful planning is required to complete the degree within four years. Students who are unable to follow this planner should consult with ECE advisors for alternatives. General education requirements that are not covered in the four-year planner are: CC (Cross-Cultural Analysis), ER (Ethnicity and Race), IM (Interpreting Arts and Media), TA (Textual Analysis), PE (Perspective), and C (Composition).

Year	Fall	Winter	Spring
1st (frosh)	MATH 19A	MATH 19B	AM 10
	CSE 12 & CSE 12L	PHYS 5A & PHYS 5L	CSE 16
2nd (soph)	AM 30 or MATH 23A	ECE 13	CSE 20
	PHYS 5C & PHYS 5N	ECE 9	ECE 10
3rd (junior)		AM 20	CSE 30
		ECE 101 & ECE 101L	CSE 107
	ECE 103 & ECE 103L	ECE 121	ECE 167 & ECE 167L
	CSE 100 & CSE 100L	CSE 101	ECE 118 & ECE 118L

4th (senior)	ECE 129A	ECE 129B	ECE 129C
	ECE 141	Advanced robotics elective	Upper-division elective

Plan for Junior Transfers

Below is a sample academic plan for students transferring to UC Santa Cruz in robotics engineering in their junior year. It assumes that all lower-division course requirements have already been satisfied, except ECE 9 and ECE 10. The plan for the third and fourth years will vary according to the electives and capstone selected. As part of the major declaration process students prepare a plan and the selected electives may affect the placement of other courses as well. Careful planning at the time of declaration is required to complete the degree within two years.

This planner assumes that most general education courses have been completed before coming to UCSC.

Year	Fall	Winter	Spring
3rd (junior)	ECE 101 & 101L	ECE 121	ECE 118 & ECE 118L
	CSE 101	ECE 9	ECE 10
4th (senior)	CSE 100 & CSE 100L	CSE 107	ECE 103 & ECE 103L
	ECE 129A	ECE 129B	ECE 129C
	ECE 141	Advanced robotics elective	ECE 167 and ECE 167L
	Elective		

Curriculum charts for all BSOE majors are available at the department's Major Curriculum Charts page.

ELECTRICAL ENGINEERING MINOR

The electrical engineering minor provides a solid foundation in the core areas of electronic circuits and signals and systems, as well as the prerequisite material in mathematics and physics. Concentration of upper-division electives in either of the major tracks constitutes substantial and focused work in the discipline of electrical engineering. This minor is particularly suitable for students with majors in applied physics or any School of Engineering major.

Course Requirements

Requirements for the minor in Electrical Engineering are the following:

Lower-Division Courses**Mathematics****All of the following**

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

Plus one of the following courses

MATH 23A	Vector Calculus	5
AM 30	Multivariate Calculus for Engineers	5

Plus one of the following options

Either these courses		
AM 10	Mathematical Methods for Engineers I	5
AM 20	Mathematical Methods for Engineers II	5
or these courses		
MATH 21	Linear Algebra	5
MATH 24	Ordinary Differential Equations	5

Science**One of the following lecture/lab combinations**

Either these courses		
PHYS 5A	Introduction to Physics I	5
PHYS 5L	Introduction to Physics I Laboratory	1
or these courses		
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1

Plus one of the following lecture/lab combinations

Either these courses		
PHYS 5C	Introduction to Physics III	5
PHYS 5N	Introduction to Physics Laboratory III	1
or these courses		
PHYS 6C	Introductory Physics III	5
PHYS 6N	Introductory Physics III Laboratory	1

Upper-Division Courses**All of the following courses**

ECE 101	Introduction to Electronic Circuits	5
ECE 101L	Introduction to Electronic Circuits Laboratory	2
ECE 103	Signals and Systems	5
ECE 171	Analog Electronics	5
ECE 171L	Analog Electronics Laboratory	2

Electives

Plus at least 15 additional credits of upper-division or graduate courses from the lists below. All of the upper-division electives must come from the same concentration.

Electronics/Optics Concentration Courses**Electrical and Computer Engineering**

ECE 104	Bioelectronics	5
ECE 118	Introduction to Mechatronics	10
ECE 118L	Introduction to Mechatronics Laboratory	2
ECE 121	Microcontroller System Design	7
ECE 130	Introduction to Optoelectronics and Photonics	5
ECE 130L	Introduction to Optoelectronics Laboratory	1
ECE 230	Optical Fiber Communication	5
ECE 136	Engineering Electromagnetics	5
ECE 141	Feedback Control Systems	5
ECE 241	Introduction to Feedback Control Systems	5
ECE 157	RF Hardware Design	5
ECE 157L	RF Hardware Design Laboratory	2
ECE 167	Sensing and Sensor Technologies	7
ECE 167L	Sensing and Sensor Technologies Lab	2
ECE 172	Advanced Analog Circuits	5
ECE 221	Advanced Analog Integrated Circuits	5
ECE 173	High-Speed Digital Design	5
ECE 173L	High-Speed Digital Design Laboratory	2
ECE 175	Energy Generation and Control	5
ECE 175L	Energy Generation and Control Laboratory	2

ECE 176	Energy Conservation and Control	5
ECE 176L	Energy Conversion and Control Laboratory	2
ECE 177	Power Electronics	5
ECE 177L	Power Electronics Laboratory	2
ECE 178	Device Electronics	5
ECE 180J	Advanced Renewable Energy Sources, Storage, and Smart Grids	5
ECE 201	Introduction to Nanotechnology	5
ECE 203	Nanocharacterization of Materials	5
ECE 231	Optical Electronics	5

(ECE 130 and ECE 230, ECE 141 and ECE 241, and ECE 172 and ECE 221 are undergraduate and graduate courses taught in conjunction, and only one can be taken for this program.)

Communications, Signals, Systems, and Controls Concentration

Electrical and Computer Engineering

ECE 118	Introduction to Mechatronics	10
ECE 118L	Introduction to Mechatronics Laboratory	2
ECE 130	Introduction to Optoelectronics and Photonics	5
ECE 130L	Introduction to Optoelectronics Laboratory	1
ECE 230	Optical Fiber Communication	5
ECE 136	Engineering Electromagnetics	5
ECE 141	Feedback Control Systems	5
ECE 241	Introduction to Feedback Control Systems	5
ECE 152	Introduction to Wireless Communications	5
ECE 252	Wireless Communications	5
ECE 153	Digital Signal Processing	5
ECE 250	Digital Signal Processing	5
ECE 237	Image Processing and Reconstruction	5
ECE 251	Principles of Digital Communications	5
ECE 253	Introduction to Information Theory	5
ECE 255	Error Control Coding	5
ECE 256	Statistical Signal Processing	5

Computer Science and Engineering

CSE 150	Introduction to Computer Networks	5
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CSE 150L	Introduction to Computer Networks Laboratory	2
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(ECE 130 and ECE 230, ECE 152 and 252, ECE 141 and ECE 241, and ECE 153 and ECE 250 are undergraduate and graduate courses taught in conjunction, and only one can be taken for this program.)

ASSISTIVE TECHNOLOGY MINOR

The assistive technology minor is designed for students interested in helping people with movement disabilities. The emphasis is on designing exoskeletons and robots built on two core cross-disciplinary courses: Mechatronics (ECE 118 & ECE 118L) and Functional Anatomy (METX 135 & METX 135L).

The minor requirements may satisfy the requirements of other majors or minors under the campus policy discussed under Major and Minor Requirements. Because of the large number of courses required, it is most suitable for students in majors already requiring a substantial number of these courses. The minor cannot be combined with the Assistive Technology: Motor concentration of the former bioengineering major or the robotics engineering B.S. major. ECE 121, ECE 141 and ECE 167 cannot also be used to satisfy electrical engineering B.S. electives.

Course Requirements

Requirements for the minor in assistive technology are the following:

Lower-Division Courses

All of the following

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
PHYS 5A	Introduction to Physics I	5
PHYS 5L	Introduction to Physics I Laboratory	1
PHYS 5C	Introduction to Physics III	5
PHYS 5N	Introduction to Physics Laboratory III	1
CHEM 1A	General Chemistry	5
BIOL 20A	Cell and Molecular Biology	5
BIOE 20B	Development and Physiology	5
CSE 12	Computer Systems and Assembly Language	5
CSE 13E	Embedded Systems and C Programming	7

Plus one of the following

Either this course

AM 10	Mathematical Methods for Engineers I	5
or this course		
MATH 21	Linear Algebra	5

Plus one of the following

Either this course		
AM 20	Mathematical Methods for Engineers II	5
or this course		
MATH 24	Ordinary Differential Equations	5

Upper-Division Courses**All of the following courses**

ECE 101	Introduction to Electronic Circuits	5
ECE 101L	Introduction to Electronic Circuits Laboratory	2
ECE 103	Signals and Systems	5
CSE 100	Logic Design	5
CSE 100L	Logic Design Laboratory	2
ECE 118	Introduction to Mechatronics	10
METX 135	Functional Anatomy	5
METX 135L	Functional Anatomy Lab	2
ECE 167	Sensing and Sensor Technologies	7

Plus one of the following courses

ECE 121	Microcontroller System Design	7
ECE 141	Feedback Control Systems	5

BIOELECTRONICS AND BIOPHOTONICS MINOR

The bioelectronics and biophotonics minor is designed for students in chemical, biological, environmental sciences, and biomolecular engineering to learn how to interface biological systems with electronics including sensors, actuators, and wireless communications. Introductory chemistry and physiology is desired, but not required.

Course Requirements

Essential courses for the minor in bioelectronics and biophotonics deal with the analog electronics to interface biological systems to sensors and with the signals they produce, both analog and digital, for interfacing to computer systems. The minor requirements may satisfy the requirements of other majors or minors under the campus policy discussed under Major and Minor Requirements. The minor cannot be combined with the bioelectronics concentration of the former bioengineering

major or the electrical engineering B.S. or electrical engineering minor.

Requirements for the minor in bioelectronics and biophotonics consist of the following:

Lower-Division Courses**All of the following**

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
PHYS 5A	Introduction to Physics I	5
PHYS 5L	Introduction to Physics I Laboratory	1
PHYS 5C	Introduction to Physics III	5
PHYS 5N	Introduction to Physics Laboratory III	1
CSE 12	Computer Systems and Assembly Language	5
ECE 13	Computer Systems and C Programming	7

Plus one of the following

Either this course		
AM 10	Mathematical Methods for Engineers I	5
or this course		
MATH 21	Linear Algebra	5

Plus one of the following

Either this course		
AM 20	Mathematical Methods for Engineers II	5
or this course		
MATH 24	Ordinary Differential Equations	5

Upper-Division Courses**All of the following courses**

CSE 100	Logic Design	5
CSE 100L	Logic Design Laboratory	2
ECE 101	Introduction to Electronic Circuits	5
ECE 101L	Introduction to Electronic Circuits Laboratory	2
ECE 103	Signals and Systems	5
ECE 121	Microcontroller System Design	7
ECE 167	Sensing and Sensor Technologies	7

ECE 167L	Sensing and Sensor Technologies Lab	2
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Plus one of the following options

Either this course		
ECE 104	Bioelectronics	5
or these courses		
ECE 130	Introduction to Optoelectronics and Photonics	5
ECE 130L	Introduction to Optoelectronics Laboratory	1
or this course		
BME 140	Bioinstrumentation	5

ECE 130 & ECE 130L requires PHYS 5B

ELECTRICAL AND COMPUTER ENGINEERING CONTIGUOUS BACHELOR'S/MASTER'S PATHWAY

The Department of Electrical and Computer Engineering (ECE) offers a combined bachelor's (B.S.) and master's of science (M.S.) degree path. Undergraduate students can apply to this program to earn a B.S. degree in their own major together with an M.S. degree in electrical and computer engineering. Depending on the student's progress, students can complete the combined path in five years.

ADMISSION PROCESS TO THE CONTIGUOUS PATHWAY

Students can apply to the B.S./M.S. contiguous pathway in electrical and computer engineering at any time starting in the first quarter of junior standing. Admission to the contiguous pathway program in ECE is open to all qualified UC Santa Cruz students. All students who apply to the pathway will be admitted into it, provided they satisfy the requirements (see below). However, approval of an undergraduate student into a five-year bachelor's/master's path does not automatically guarantee admission into the one-year master's program. Students apply for admission into the M.S. program during their senior year using the same procedure and timeline as all other applicants to the program, except that no graduate record examination (GRE) is required to apply. Students are then considered for the M.S. program along with regular applicants. Students who do not satisfy the requirements for the contiguous pathway will be encouraged to apply to the regular M.S. program.

Requirements

Requirements

The minimum requirements for the B.S./M.S. contiguous pathway are as follows:

- Applicants must have a 3.0 GPA when they apply to the B.S./M.S. contiguous pathway program, and must maintain a 3.0 GPA or higher until the completion of their undergraduate requirements.
- For the chosen core area the student is applying to, it is required to meet the following course requirements before starting the M.S. year of the B.S./M.S. contiguous pathway program:

Electronic Circuits and Energy Systems

At least two classes from one of the following two lists with grade B+ or higher:

Electronic Circuits

ECE 157	RF Hardware Design	5
ECE 171	Analog Electronics	5
ECE 172	Advanced Analog Circuits	5
ECE 173	High-Speed Digital Design	7
ECE 177	Power Electronics	5

or

Energy Systems

ECE 171	Analog Electronics	5
ECE 175	Energy Generation and Control	5
ECE 176	Energy Conservation and Control	5
ECE 177	Power Electronics	5

Photonics and Electronic Devices

At least two classes from the following list with grade B+ or higher:

ECE 102	Properties of Materials	5
ECE 130	Introduction to Optoelectronics and Photonics	5
ECE 135	Electromagnetic Fields and Waves	5

Robotics, Controls, and Cyber-Physical Systems

At least two classes from the following lists with grade B+ or higher:

One required course

ECE 141	Feedback Control Systems	5
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And at least one course from the following list

ECE 118	Introduction to Mechatronics	10
ECE 121	Microcontroller System Design	7
ECE 167	Sensing and Sensor Technologies	7

Signals, Image Processing, and Communications

Both of the following classes with grade B+ or higher:

ECE 151	Communications Systems	5
ECE 153	Digital Signal Processing	5

ELECTRICAL AND COMPUTER ENGINEERING M.S.

Introduction

The Department of Electrical and Computer Engineering (ECE) at the University of California, Santa Cruz (UCSC) offers master of science (M.S.) and doctor of philosophy (Ph.D.) degree programs and conducts research in the following core areas:

- Electronic Circuits and Energy Systems
- Photonic and Electronic Devices
- Robotics, Control, and Cyber-Physical Systems
- Signals, Image Processing, and Communication Systems

For more information about the core areas and associated graduate courses, the department, and its faculty, please visit the Electrical and Computer Engineering Department website.

Students begin the program with the completion of courses in a core area of interest and then proceed to do research in their area of specialization. The M.S. degree can be completed in one year. M.S. students must complete a master's thesis (Plan I: Thesis), pass the comprehensive examination (Plan II: Comprehensive Examination), or complete a project (Plan II: Project). Part-time study is possible for students working in industry while attending school.

The default track for all admitted students is the comprehensive examination track. Upon enrollment, students are assigned an academic faculty adviser. These advisers will assist in course selection and guidance on program options. Students indicate their core area of study on their admission application. Core areas of study are 1) electronic circuits and energy systems; 2) photonic and electronic devices; 3) robotics, control, and cyber-physical systems; 4) signals, image processing, and communications systems. These core areas determine the broad focus of a student's study (providing depth) while still providing the flexibility needed within the program to allow for breadth and the desire to meet each individual student's goals for study.

Requirements

Course Requirements

Thesis Track

Each student is required to take 45 credits, which must consist of:

- At least 15 credits from one of the four core areas defined above.
- At least 20 credits of the total 45 credits must be satisfied through ECE graduate courses.*
- At most 10 credits of independent study (ECE 297, ECE 299) are counted toward the ECE course requirements.
- At most 5 credits of ECE 290 and ECE 291 can be counted toward the ECE course requirements. A combined total of 5 credits from ECE 290 and/or ECE 291 are mandatory.

Total credits required for the M.S. degree is 45.

*The 20 credits of ECE graduate courses can include courses from the core areas only if they are ECE graduate courses. Graduate courses offered by other departments and approved for the core areas are not counted as ECE graduate courses.

Note that each graduate course satisfying the above requirements typically covers 5 credits.

Comprehensive Examination Track

Each student is required to take 45 credits, which must consist of:

- At least 15 credits from one of the four core areas defined above.
- At least 25 credits of the total 45 credits must be satisfied through ECE graduate courses*.
- At most 5 credits of ECE 290 and ECE 291 can be counted toward the ECE course requirements. A combined total of 5 credits from ECE 290 and/or ECE 291 are mandatory.

Total credits required for the M.S. degree is 45.

*The 25 credits of EE graduate courses can include courses from the core areas only if they are ECE graduate courses. Graduate courses offered by other departments and approved for the core areas are not counted as ECE graduate courses.

Note that each graduate course satisfying the above requirements typically covers 5 credits. Independent study credits do not count toward the degree requirements for students in the comprehensive examination track.

Each student in the comprehensive examination track must pass the comprehensive examination. Students may not take the comprehensive exam in the same subject more than twice, and may attempt a maximum of six subjects.

Project Track

Each student is required to take 45 credits, which must consist of:

- At least 15 credits must be satisfied with courses from one of the four core areas defined above.
- At least 25 credits of the total 45 credits must be satisfied through ECE graduate courses*.
- At most 5 credits of ECE 290 and ECE 291 can be counted toward the ECE course requirements. A combined total of 5 credits from ECE 290 and/or ECE 291 are mandatory.

Total credits required for the M.S. degree is 45.

*The 25 credits of EE graduate courses can include courses from the core areas only if they are ECE graduate courses. Graduate courses offered by other departments and approved for the core areas are not counted as ECE graduate courses.

Note that each graduate course satisfying the above requirements typically covers 5 credits.

Other Requirements

Thesis Track

A master's research thesis, viewed as acceptable by a thesis committee appointed by the program faculty, is required of each student in this track. To fulfill this requirement, the student submits a written proposal to a faculty member, usually by the third academic quarter. By accepting the proposal, the faculty member becomes the thesis advisor. The remaining members of the thesis reading committee are appointed by the student's program in consultation with the thesis advisor. The majority of the membership of a thesis reading committee shall be members of the Santa Cruz Division of the Academic Senate. Each committee member is provided a copy of the proposal. Upon completion of the thesis work, the student presents an expository talk on the thesis research, and the final thesis must be accepted by the master's thesis reading committee before the award of the master of science degree. The completed thesis must be filed with the Graduate Division by the end of instruction in the term in which the student expects the degree to be awarded.

Comprehensive Examination Track

The comprehensive exams are only available for ECE graduate courses approved in the four core areas. Graduate courses approved in the four core areas outside ECE (such as AM or CSE) are not available for the comprehensive exams.

At the end of each quarter students will have the opportunity to take the section of the comprehensive examination relevant to the courses offered that quarter that are approved for the core areas as outlined above. The comprehensive examination will focus on fundamental material related to the subject matter of the course and will be offered, typically, on Friday of final's week. The results of these examination sections, when integrated, will comprehensively test the student's mastery of the curriculum. In order to pass the overall

comprehensive examination, a student is required to pass at least three sections of the comprehensive examination in the proposed core area of study. Students may attempt more than one section per quarter.

Master's students must take the corresponding course in order to take the comprehensive exam in a given subject. A maximum of six exams may be attempted, and a student must pass a minimum of three subjects within their core area in order to fulfill the comprehensive exam capstone requirement.

Students must register for the exam subjects they wish to take each quarter when the call for exam registrations is sent. Students who do not register may not be permitted to take the exam.

The comprehensive examinations are closed-note, closed-book exams, and the use of calculators or other electronic devices is not permitted during the exam. The instructor who writes the exam may deem it appropriate to provide an equation sheet or other reference sheet with the exam, however no other reference materials are allowed. Students are allocated one hour per exam subject. Students who are taking only one exam will be asked to leave the exam room after one hour. Students who are taking multiple exams in the same quarter may allocate their exam time as they see fit, however they will receive only one hour of exam time per subject.

Students are notified of their exam results (pass/fail) by email prior to the start of the following quarter, and the results are also recorded in the student's file by the graduate advisor. If students have questions about the exam or how it was graded, they should contact the instructor who wrote the exam to request a meeting to go over the exam. Once a student has passed three exam subjects within their core area, they have fulfilled the comprehensive examination requirement and are eligible for graduation as soon as they have completed all of the other requirements for the degree.

Students in the M.S. comprehensive examination track are not eligible for Filing Fee status.

Note that Plan II: Comprehensive Examination track, is the default option for all M.S. students. Students can select Plan I: Thesis track, or Plan II: Project, only if they can find a faculty sponsor to supervise the thesis or project.

Project Track

Completion of a project report is required for the master's degree in this track. To fulfill this requirement, the student submits a written proposal to a faculty member, usually by the third academic quarter. By accepting the proposal, the faculty member becomes the project advisor. In consultation with the advisor, the student forms a project reading committee with at least one additional faculty member, each of whom is provided a copy of the proposal. Upon completion of the project, the student submits the report to the project reading committee, and the final project must be accepted by the

reading committee before the award of the master of science degree.

Review of Progress

Each year, the faculty reviews the progress of every student. Students not making adequate progress toward completion of degree requirements (see the Graduate Student Handbook for the policy on satisfactory academic progress) are subject to dismissal from the program. Students with academic deficiencies may be required to take additional courses. Full-time students with no academic deficiencies are normally expected to complete the degree course requirements at the rate of at least two courses each quarter. Full-time students must complete all course requirements within two years for the M.S.

Students receiving two or more grades of U (unsatisfactory) or below B- in the School of Engineering courses are not making adequate progress and will be placed on academic probation for the following three quarters of registered enrollment. Withdrawing or taking a leave of absence does not count as enrollment. Part-time enrollment is counted as a half-quarter of enrollment.

If an electrical and computer engineering graduate student fails a School of Engineering course while on probation, the Electrical and Computer Engineering Department may request the graduate dean to dismiss that student from the graduate program. If after being removed from probation, the student again fails a School of Engineering course, he or she will return immediately to academic probation.

Graduate students experiencing circumstances or difficulties that impact their academic performance should contact their advisor and the graduate director immediately. Students may appeal their dismissal to the graduate committee.

Applying for Graduation

All candidates for a degree must submit an Application for Doctor of Philosophy Degree to the Graduate Advising Office by the date stated in the Academic and Administrative Calendar for the quarter you wish to receive the degree. Failure to declare candidacy by the deadline means that you cannot be considered a candidate until the next term.

A student is required to be registered or on Filing Fee Status, whichever is applicable, during the quarter in which the degree is conferred. Students should consult the department advisor to determine which option fits their situation. For more information about applying for graduation, visit the Baskin School of Engineering Graduate Studies website.

ELECTRICAL AND COMPUTER ENGINEERING PH.D.

Introduction

The Department of Electrical and Computer Engineering (ECE) at the University of California, Santa Cruz (UCSC) offers master of science (M.S.) and doctor of philosophy (Ph.D.) degree programs and conducts research in the following core areas:

- Electronic Circuits and Energy Systems
- Photonic and Electronic Devices
- Robotics, Control, and Cyber-Physical Systems
- Signals, Image Processing, and Communication Systems

For more information about the core areas and associated graduate courses, the department, and its faculty, please visit the Electrical and Computer Engineering Department website.

Students begin the program with the completion of courses in a core area of interest and then proceed to do research in their area of specialization. Ph.D. students are required to take a preliminary exam within their first two years of study. After completing the course requirements, students must pass an oral qualifying exam and write a dissertation. Part-time study is possible for students working in industry while attending school.

Advancement to Candidacy

Course Requirements

Each student is required to take 55 credits which must consist of:

- At least 20 credits in one of the four core areas defined above.
- At least 30 of the total 55 credits must be satisfied through ECE graduate courses.
- At most 10 credits of independent study (ECE 297, ECE 299) will be counted toward ECE course requirements.
- A combined total of 5 credits from ECE 290 and/or ECE 291 are mandatory, but no more than 5 credits from these two courses can be counted toward degree requirements. Students are required to take ECE 291 in order to become eligible to be a teaching assistant.

Total credits required for the Ph.D. degree is 55.

The 30 credits of ECE graduate courses can include courses from the core areas only if they are ECE graduate courses. Graduate courses offered by other departments and approved for the core areas are not counted as ECE graduate courses.

* For students already holding a Master of Science in Electrical Engineering (M.S.E.E.) or equivalent degree, at most 20 credits of transfer credit may be granted for equivalent coursework performed at the students' M.S. granting institution. Credit transfer is subject to approval

by the instructor of the equivalent UCSC course and the electrical and computer engineering graduate director.

The ECE Department sponsors a weekly graduate seminar course, ECE 290, in fall, winter, and spring quarters. All graduate students are required to register and attend for at least one quarter during their graduate student career, and are encouraged to enroll every quarter. The graduate seminar consists of talks by invited speakers from industry and academia.

Some faculty also sponsor a weekly lab seminar or lab meeting, ECE 280. Faculty advisers can require their students to enroll for these seminars and they do count toward maintaining full-time enrollment, however they do not count toward the coursework requirements for the degree.

Foreign Language Requirements

Teaching Requirements

Pre-Qualifying Requirements

Preliminary Examination

At the end of the first year (i.e., no later than the fall quarter in the following year after their entry), students admitted to the Ph.D. program must satisfy the requirements of the preliminary examination to continue in the Ph.D. program. This examination is as follows:

- Pass the comprehensive exam for the M.S. program in one of the core areas
- Pass one additional section of the M.S. comprehensive examination from a different core area of the comprehensive examination.

The preliminary exams are only available for ECE graduate courses approved in the four core areas. Graduate courses approved in the four core areas outside ECE (such as AM or CSE) are not available for the preliminary exams.

At the end of each quarter, students will have the opportunity to take the section(s) of the preliminary examination relevant to the courses offered that quarter that are approved for the core areas. The preliminary examination will focus on fundamental material related to the subject matter of the course and will be offered, typically, the Friday before finals week. The results of these examination sections, when integrated, will comprehensively test the student's mastery of the curriculum. In order to pass the overall preliminary examination, a student is required to pass at least three preliminary exam subjects their core area, plus one exam that is not approved for their core area.

Students may attempt more than one subject per quarter. A maximum of eight exams may be attempted, and a student must pass a minimum of four subjects—three within their selected core area, and one from a different core area. Students who have obtained approved course substitutions for one or more courses within their core

area may attempt the preliminary exams for those substituted courses without having taken the course at UCSC. In such cases, students are strongly encouraged to contact the instructor of the UCSC course at the beginning of the quarter to request course materials and/or audit the class.

Students must register for the exam subjects they wish to take each quarter when the call for exam registrations is sent. Students who do not register may not be permitted to take the exam.

Passing three preliminary exam subjects within one core area satisfies the comprehensive exam capstone requirement for the ECE Master's degree. Ph.D. students who wish to apply for a non-terminal Master's degree once they have completed this requirement are welcome to do so, provided that they have also met the coursework requirements for the M.S. degree.

Qualifying Examination

This oral examination is a defense of the student's thesis prospectus and a test of the student's knowledge in advanced technical areas of relevance to the dissertation topic. This oral examination consists of a seminar-style talk before the examining committee, where the student describes the thesis prospectus, followed by questions from the committee on the substance of the talk and the areas of presumed expertise of the student. The examination, taken typically in the third year of Ph.D. study, is administered by a Ph.D. qualifying examination committee, consisting of at least four examiners. The composition of the committee must be approved by the graduate director and the dean of graduate studies whereupon the student and the committee are notified.

If the student does not pass the qualifying examination, the student may be asked to complete additional coursework, or other research-related work, before retaking the examination. The student may be allowed to retake the qualifying examination once, and the composition of the examining committee will remain the same for the second try. Students who fail the qualifying examination twice may be dismissed from the Ph.D. program.

Ph.D. students who have not advanced to candidacy by the end of the fourth year will be recommended for academic probation.

Post-Qualifying Requirements

Advancement to candidacy requires that the student:

- pass the preliminary examination;
- complete all course requirements prior to taking the qualifying examination;
- clear all Incompletes from the student's record;
- pass the qualifying examination; and
- have an appointed Ph.D. dissertation reading committee.

Transfer Credit

For students already holding an M.S.E.E. or equivalent degree, at most 20 credits of transfer credit may be granted for equivalent coursework performed at the student's M.S. granting institution. Credit transfer is subject to approval of the instructor of the equivalent UCSC course and the ECE graduate director.

Non-Terminal Master's Degree

Students not already holding an M.S.E.E. degree, who are studying for the Ph.D. degree, may apply to be granted a M.S. degree when they have fulfilled all the M.S. degree requirements (including submission of an M.S. thesis or project, or passing the comprehensive examination).

Materials Fee

Please see the section on fees under School of Engineering.

Dissertation

Dissertation

After advancement to candidacy, work on the dissertation research progresses until the dissertation is completed. The Ph.D. dissertation must show the results of in-depth research, be an original contribution of significant knowledge to the student's field of study, and include material worthy of publication. The student is strongly advised to submit research work for publication in advance of completing the dissertation so that the latter requirement is clearly satisfied. The Ph.D. dissertation results are presented in both oral and written forms, the oral form being a dissertation defense (see below) and the written form being the Ph.D. dissertation. The student must submit his or her written Ph.D. dissertation to the dissertation reading committee at least one month before the defense.

Dissertation Defense

Each Ph.D. candidate submits the completed dissertation to a Ph.D. dissertation reading committee at least one month prior to the dissertation defense. The appointment of the dissertation reading committee is made immediately after the qualifying examination and is necessary for advancing to candidacy. The candidate presents his or her research results in a public seminar sponsored by the dissertation supervisor. The seminar is followed by a defense of the dissertation to the reading committee (only), who will then decide whether the dissertation is acceptable or requires revision. Successful completion of the dissertation fulfills the final academic requirement for the Ph.D. degree.

Academic Progress

Each year, the faculty reviews the progress of every student. Students not making adequate progress toward completion of degree requirements (see the Graduate Student Handbook for the policy on satisfactory academic progress) are subject to dismissal from the program.

Students with academic deficiencies may be required to take additional courses. Full-time students with no academic deficiencies are normally expected to complete the degree course requirements at the rate of at least two courses each quarter. Full-time students must complete all course requirements within two years for the M.S. and three years for the Ph.D.

Students receiving two or more grades of U (unsatisfactory) or below B- in the School of Engineering courses are not making adequate progress and will be placed on academic probation for the following three quarters of registered enrollment. Withdrawing or taking a leave of absence does not count as enrollment. Part-time enrollment is counted as a half-quarter of enrollment.

If an electrical and computer engineering graduate student fails a School of Engineering course while on probation, the Electrical and Computer Engineering Department may request the graduate dean to dismiss that student from the graduate program. If after being removed from probation, the student again fails a School of Engineering course, he or she will return immediately to academic probation.

Graduate students experiencing circumstances or difficulties that impact their academic performance should contact their adviser and the graduate director immediately. Students may appeal their dismissal to the graduate committee.

Normative Time

Normative time for completion of the dissertation is three years from the date of advancement to candidacy, and six years in total. Students who fail to complete the degree in six years must request a program extension from the Graduate Division. A written request, signed by the student and their faculty adviser, detailing the timeline to degree completion should be approved by the graduate director prior to submission to the dean of graduate studies. Multiple extensions may be considered.

Students who fail to complete their dissertation within three years of advancement to candidacy, or who fail to complete the Ph.D. degree within six years, may be recommended for academic probation. In order to maintain good academic standing, students must advance to candidacy within the first three years, and complete the degree within the subsequent three years.

Students who are on part-time status accrue time-to-degree at one-half the rate of full-time students for those quarters during which they are on approved part-time study. Doctoral students who have advanced to candidacy accrue time-to-degree at the regular rate, regardless of part-time or full-time status. Taking a leave of absence does not "stop the clock" on normative time. Time-to-degree continues to accrue at the normal rate while students are on approved leave.

If the Ph.D. degree is not awarded within seven years from the date of advancement to candidacy, the student's candidacy will lapse and the student will be required to

pass a new Qualifying Exam prior to submitting the dissertation, or to undergo another formal review as directed by the student's department, and the result of this examination or review will be transmitted in writing to the Graduate Council (Academic Senate Regulation 18.6).

Applying for Graduation

All candidates for a degree must submit an Application for Doctor of Philosophy Degree to the Graduate Advising Office by the date stated in the Academic and Administrative Calendar for the quarter you wish to receive the degree. Failure to declare candidacy by the deadline means that you cannot be considered a candidate until the next term.

A student is required to be registered or on Filing Fee Status, whichever is applicable, during the quarter in which the degree is conferred. Students should consult the department adviser to determine which option fits their situation. For more information about applying for graduation, visit the Baskin School of Engineering Graduate Studies website.

ROBOTICS AND CONTROL DESIGNATED EMPHASIS

Introduction

The graduate designated emphasis (DE) leading to the degree notation "with an emphasis in Robotics and Control" is a collaboration of faculty from several Baskin School of Engineering programs and is administered by the Department of Electrical and Computer Engineering. Students wishing to complete a master's thesis or doctoral dissertation in this area must satisfy the degree requirements of a primary program as well as of the DE. The DE is most suitable for students pursuing degrees in Applied Mathematics, Electrical and Computer Engineering, and Statistics, but students from any area may work in this interdisciplinary field so long as they meet all requirements, including progress, within the primary degree program. A current list of the robotics and control faculty and electives is available at the Electrical and Computer Engineering website.

Requirements

Committee Composition and Departmental Approvals

The student's M.S. project or Ph.D. qualifying exam, or Ph.D. committee must include one member of the robotics and control faculty.

Course Requirements

The student must complete four five-credit graduate courses and several two-credit seminar courses. All students must complete ECE 241, Introduction to Feedback Control Systems, and three 5-credit robotics and control graduate electives.

Master's students must complete two offerings of ECE 280C, Seminar in Control (2 credits).

Doctoral students must complete four offerings of ECE 280C.

ECE 241	Introduction to Feedback Control Systems	5
ECE 280C	Seminar on Control	2

Writing, Research and/or Teaching Requirements

The student's dissertation or thesis must include a significant section (chapter) related to robotics and control, with content suitable for a conference or journal article. Students pursuing the M.S. project track must complete a project report related to robotics and control, with content suitable for a conference or journal article.

Academic Progress

[Optional Catchall]

Statistics

Baskin School of Engineering
(831) 459-2158
<https://www.soe.ucsc.edu>

PROGRAMS OFFERED

Statistics Minor (p. 530)

Statistical Science Contiguous Bachelor's/Master's Pathway (p. 531)

Statistical Science M.S. (p. 533)

Statistical Science Ph.D. (p. 535)

Statistics Designated Emphasis (D.E.) (p. 537)

Data Science Designated Emphasis (D.E.) (p. 538)

Statistics is a discipline devoted to the use of mathematical methods and reasoning to solve real-world problems of a scientific or decision-making nature in a wide variety of subjects, principally (but not exclusively) in engineering, medicine, the physical and biological sciences, and the social sciences. Statistics, construed broadly, is the study of uncertainty: how to measure it (using ideas and methods in probability theory), and what to do about it (using concepts from statistical inference and decision theory).

The Statistics Department at UC Santa Cruz offers M.S. and Ph.D. programs in statistical science. The goal of these programs is to help students develop into independent scholars who are prepared for productive careers in research, teaching, and industry. The department also offers a designated emphasis in statistics and a minor in statistics.

Additional information on these programs can be found on the department website.

STATISTICS MINOR

The statistics minor is available for students who wish to gain a quantitative understanding of how to (a) measure uncertainty and (b) make good decisions on the basis of incomplete or imperfect information, and to apply these skills to their interests in another field. This minor could also be combined with a major in mathematics as preparation for a graduate degree in statistics or biostatistics.

Course Requirements

Lower-Division Courses

Basic calculus sequence

Either these courses

AM 11A Mathematical Methods for Economists I 5

AM 11B Mathematical Methods for Economists II 5

or these courses

MATH 11A Calculus with Applications 5

MATH 11B Calculus with Applications 5

or these courses

MATH 19A Calculus for Science, Engineering, and Mathematics 5

MATH 19B Calculus for Science, Engineering, and Mathematics 5

or these courses

MATH 20A Honors Calculus 5

MATH 20B Honors Calculus 5

Plus one course from each of the following four categories

Statistical concepts

Either this course

STAT 5 Statistics 5

or these courses

STAT 7 Statistical Methods for the Biological, Environmental, and Health Sciences 5

STAT 7L Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory 2

Computer Programming

Either this course

BME 160 Research Programming in the Life Sciences 6

or one of these

CSE 20 Beginning Programming in Python 5

CSE 30 Programming Abstractions: Python 7

ASTR 119 Introduction to Scientific Computing 5

Linear Algebra

One of the following courses:

AM 10 Mathematical Methods for Engineers I 5

MATH 21 Linear Algebra 5

It is recommended that students also take AM 20 or MATH 24.

Multivariate Calculus

Either this course

MATH 22 Introduction to Calculus of Several Variables 5

or this course

AM 30 Multivariate Calculus for Engineers 5

or these courses

MATH 23A Vector Calculus 5

MATH 23B Vector Calculus 5

Upper-Division Courses

Probability

One of the following "probability" courses:

STAT 131 Introduction to Probability Theory 5

STAT 203 Introduction to Probability Theory 5

CSE 107 Probability and Statistics for Engineers 5

Statistical Inference

STAT 132 Classical and Bayesian Inference 5

Computational Methods

AM 147 Computational Methods and Applications 5

Plus two electives from the following list of courses

STAT 108 Linear Regression 5

STAT 204 Introduction to Statistical Data Analysis 5

STAT 206 Applied Bayesian Statistics 5

STAT 207 Intermediate Bayesian Statistical Modeling 5

STAT 208 Linear Statistical Models 5

BME 205	Bioinformatics Models and Algorithms	5
ECE 145	Estimation and Introduction to Control of Stochastic Processes	5
CSE 142	Machine Learning	5
ECON 104	Is There Truth in Numbers: The Role of Statistics in Economics	5
ECON 113	Introduction to Econometrics	5
ECON 114	Advanced Quantitative Methods	5
ECON 120	Development Economics	5
ECON 161B	Marketing Research	5
ECON 190	Senior Proseminar	5
MATH 105A	Real Analysis	5
MATH 105B	Real Analysis	5
MATH 114	Introduction to Financial Mathematics	5
PSYC 181	Psychological Data Analysis	5

Note: Students planning graduate work in statistics are recommended to choose MATH 23A and MATH 23B, STAT 204, STAT 205, and MATH 105A and MATH 105B.

STATISTICAL SCIENCE CONTIGUOUS BACHELOR'S MASTER'S PATHWAY

The Department of Statistics offers a Statistical Science Bachelor's/Master's pathway. Undergraduate students with majors in computer science, economics, mathematics, and physics can apply to the pathway in order to earn a B.S. degree in their own major together with an M.S. degree in Statistical Science. Qualified undergraduates from other undergraduate majors may also apply to the pathway and their applications will be considered on a case by case basis. Depending on the student's progress, the B.S./M.S. pathway can be completed in five years.

Admission process to the contiguous pathway

Students must declare their interest in pursuing the B.S./M.S. contiguous pathway no later than their ninth quarter of study at UCSC, and more typically at the end of the sixth or seventh quarter of enrollment. All students who apply to the pathway will be admitted into it, provided they satisfy the requirements. However, approval of an undergraduate student into a five-year bachelor's/master's path does not automatically guarantee admission into the one-year master's program.

Students apply for admission into the M.S. program during their senior year using the same procedure and timeline as all other applicants to the program, and they will be considered for the M.S. program along with

regular applicants. In addition to all other criteria used to evaluate M.S. applicants, students in the pathway will not be admitted into the M.S. program unless they achieve a grade of at least A- in both STAT 131 and STAT 132. The path assists qualified enrolled students with a simplified graduate application process that does not require students to submit Graduate Record Examination (GRE) scores. This will be made clear to students admitted into the pathway, as early as possible.

Course Requirements

Students pursuing the contiguous pathway are expected to have a strong quantitative background. At the time they apply to the pathways they will be expected to have completed the following coursework:

Basic Requirements

To be admitted into the contiguous pathway, students must have completed this series of courses with an average GPA of 3.0 or above.

Univariate Calculus

Either

Both these courses

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

Or both these courses

MATH 20A	Honors Calculus	5
MATH 20B	Honors Calculus	5

Multivariate Calculus

MATH 22	Introduction to Calculus of Several Variables	5
	OR	
AM 30	Multivariate Calculus for Engineers	5
	OR	
MATH 23A	Vector Calculus AND	5
MATH 23B	Vector Calculus	5

Linear Algebra

AM 10	Mathematical Methods for Engineers I	5
	OR	
MATH 21	Linear Algebra	5
	OR	
PHYS 116A	Mathematical Methods in Physics	5

Introductory Statistics

STAT 5	Statistics	5
	OR	

STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
PHYS 133	OR Intermediate Laboratory	5

Programming

CSE 20	Beginning Programming in Python	5
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or higher level programming course; or equivalent

Advanced Requirements

During their junior year (or before, if appropriate), students in the pathway will be expected to take two courses:

STAT 131	Introduction to Probability Theory	5
STAT 132	Classical and Bayesian Inference	5

Students must obtain a grade no lower than A- in both courses to remain eligible for the pathway. A grade of A- or higher in STAT 131 will waive the M.S. requirement of taking STAT 203, Introduction to Probability Theory. Instead of STAT 203, students in the pathway will need to take an additional elective course to satisfy the credit requirements for the M.S. program (see sample plan below).

Students who pass STAT 131 and STAT 132 with a grade of C or higher but lower than A-, although not eligible to continue in the contiguous pathway to the M.S., will still have the opportunity to complete a minor in statistics or to apply to the M.S. through the regular admission process.

Senior Year Requirements

Students apply for admission into the M.S. program during their senior year using the same procedure and timeline as all other applicants to the program. In addition, during the senior year, students in the pathway will be required to take three graduate-level courses:

STAT 204	Introduction to Statistical Data Analysis	5
STAT 206	Applied Bayesian Statistics	5
STAT 207	Intermediate Bayesian Statistical Modeling	5

Note that all three courses satisfy requirements for the Statistical Science M.S. program and therefore cannot be counted as part of the minimum 40 credits of upper-division courses required by the undergraduate major.

Students who are accepted into the M.S. program but fail any of the three senior-year graduate courses will revert to the regular two-year M.S. timeline and will be allowed to retake them

M.S. Year Course Requirements

Students will complete the remaining required courses (STAT 200, STAT 280B, STAT 205 and STAT 208) and electives (three, one of them in lieu of STAT 203) for the M.S. program, as well as their capstone project, during their fifth year in the program.

A student enrolled in the 4+1 contiguous program will complete a total of 45 credits in classroom courses, just like students in the standard M.S. program, with 15 of those credits having been completed as part of their undergraduate degree.

If for any reason a student cannot complete the M.S. requirements during their fifth year, they will revert to the standard M.S. timeline.

STAT 200	Research and Teaching in Statistics	3
STAT 205	Introduction to Classical Statistical Learning	5
STAT 208	Linear Statistical Models	5
STAT 280B	Seminars in Statistics	2

Capstone Requirement

This is a Plan II Capstone. For the M.S. degree, students conduct an individual capstone research project (up to three quarters) and in the spring participate in a seminar in which results from their project are presented.

Examples of capstone research projects include: review and synthesis of the literature on a topical area of statistical science, application and comparison of different models and/or computational techniques from a particular area of study in statistics, and comprehensive analysis of a data set from a particular application area.

Students must submit a proposal to the potential faculty sponsor no later than the end of the fourth academic quarter. If the proposal is accepted, the faculty member becomes the sponsor and supervises the research and writing of the project. When the project is completed and written, it must be submitted to and accepted by a committee of two individuals, consisting of the faculty advisor and one additional reader. The additional reader will be chosen appropriately from within the graduate program faculty or outside of it. Either the advisor or the additional reader must be from within the graduate program faculty.

Planner

STAT 131 and STAT 132 are requirements to qualify for the program, but do not satisfy any M.S. requirement (except, in the case of STAT 131, waiving the requirement of taking STAT 203). An M.S. elective is required in lieu of STAT 203.

Sample Planner for Bachelor's/Master's Pathway

	Fall	Winter	Spring
Junior Year	STAT 131	STAT 132	

Senior Year	STAT 204	STAT 206	STAT 207
M.S. Year	STAT 200 (3 credits)	STAT 205	STAT 208
	M.S. elective	M.S. elective	STAT 296 (10 credits)
	M.S. elective	STAT 296	
	STAT 280B (2 credits)		

- introductory statistics (UCSC equivalent STAT 5 or STAT 7); and
- introductory calculus-based probability and statistical inference (UCSC equivalent STAT 131 and STAT 132).

Relationship of M.S. and Ph.D. programs

The M.S. and Ph.D. programs are freestanding and independent, so that students can be admitted to either. Students completing the M.S. program may proceed into the Ph.D. program upon successful completion of the pre-qualifying examination, and application to the graduate committee and acceptance. Students in the Ph.D. program have the option of receiving the M.S. degree upon completion of the M.S. program requirements, including the capstone research project. Ph.D. core courses STAT 205B and STAT 206B can be used in place of STAT 205 and STAT 206, respectively, to fulfill the M.S. degree course requirements.

Requirements

Course Requirements

Eight core courses

M.S. students must complete eight core courses: the six 5-credit courses listed below; a 3-credit course on research and teaching (STAT 200); and a 2-credit research seminar (STAT 280B). M.S. students must complete two additional 5-credit courses from the approved list of elective courses, bringing the total non-seminar credit requirement to 43 credits. None of the additional elective courses required to satisfy the unit requirements for the M.S. program can be substituted by independent study courses (M.S. Project, Independent Study/Research, or Thesis Research).

Students in the M.S. program must take the following eight core courses:

STAT 200	Research and Teaching in Statistics	3
STAT 203	Introduction to Probability Theory	5
STAT 204	Introduction to Statistical Data Analysis	5
STAT 205	Introduction to Classical Statistical Learning	5
STAT 206	Applied Bayesian Statistics	5
STAT 207	Intermediate Bayesian Statistical Modeling	5
STAT 208	Linear Statistical Models	5
STAT 280B	Seminars in Statistics	2

5-credit core courses

All core courses are 5-credit courses, except for STAT 200 and STAT 280B. STAT 200 is a 3-credit course which covers basic teaching techniques for teaching assistants, and examines research and professional training items, as well as ethical issues relating to

STATISTICAL SCIENCE M.S.

Introduction

Students in the statistical science program learn to develop and use statistical methods to provide a probabilistic assessment of the variability in different data structures. This knowledge is applied to the quantification of the uncertainties inherent in the discoveries, summaries and conclusions that are drawn from the data analysis. The Statistical Science M.S. places emphasis on the application of statistical methods to the solution of relevant scientific, technological and engineering problems, with the goal of preparing students for professional careers

Students will obtain an M.S. in statistical science. More specifically, students will develop background on statistical theory, methods, and computing through the program coursework, with emphasis on novel methods and applications.

Undergraduate preparation for admission

We will accept students with undergraduate degrees in fields that include computer science, engineering, mathematics, natural sciences, physics, and statistics, subject to appropriate course requirements in statistics and mathematics. Undergraduate preparation in mathematics and statistics should include:

- single variable and multivariate differential and integral calculus (UC Santa Cruz equivalent AM 11A, AM 11B or MATH 19A, MATH 19B, and MATH 23A, MATH 23B);
- linear algebra (UCSC equivalent AM 10 or MATH 21);

research in science and engineering. STAT 280B is a 2-credit seminar course, which involves attending the Statistics Department colloquia and participating in the discussion session after the seminar presentation. The strict requirement for STAT 280B is for students to take it once in their first year in the program. However, students are strongly recommended to take STAT 280B each quarter throughout their graduate studies.

All core courses must be taken for a letter grade (except for STAT 200 and STAT 280B, which are given on a satisfactory/unsatisfactory basis). In order to maintain a full load for graduate standing after their first year, students take additional courses, including independent study courses, from the approved list of elective courses, appropriate to their research interests and selected in consultation with their advisors.

Electives available to MS students include:

STAT 202	Linear Models in SAS	5
STAT 209	Generalized Linear Models	5
STAT 222	Bayesian Nonparametric Methods	5
STAT 223	Time Series Analysis	5
STAT 224	Bayesian Survival Analysis and Clinical Design	5
STAT 225	Multivariate Statistical Methods	5
STAT 226	Spatial Statistics	5
STAT 227	Statistical Learning and High Dimensional Data Analysis	5
STAT 229	Advanced Bayesian Computation	5
STAT 243	Stochastic Processes	5
STAT 244	Bayesian Decision Theory	5
STAT 246	Probability Theory with Markov Chains	5
AM 216	Stochastic Differential Equations	5
AM 230	Numerical Optimization	5
AM 250	An Introduction to High Performance Computing	5
CSE 242	Machine Learning	5
CSE 243	Data Mining	5
CSE 249	Large-Scale Web Analytics and Machine Learning	5
CSE 261	Advanced Visualization	5
CSE 263	Data Driven Discovery and Visualization	5
CSE 272	Information Retrieval	5
CSE 277	Random Process Models in Engineering	5
ECE 253	Introduction to Information Theory	5
ECE 256	Statistical Signal Processing	5
ECON 211A	Advanced Econometrics I	5
ECON 211B	Advanced Econometrics II	5
ENVS 215A	Geographic Information Systems and	5

Environmental Applications

ENVS 215L Exercises in Geographic Information Systems 2

ENVS 215L is the concurrent lab to ENVS 215A. The lecture/lab combination counts as one course.

Other Requirements

This is a Plan II Capstone. For the M.S. degree, students conduct an individual capstone research project in their second year (up to three quarters), and in the spring of that year participate in a seminar in which results from their project are presented. Examples of capstone research projects include: review and synthesis of the literature on a topical area of statistical science; application and comparison of different models and/or computational techniques from a particular area of study in statistics; comprehensive analysis of a data set from a particular application area.

Students must submit a proposal to the potential faculty sponsor no later than the end of the fourth academic quarter. If the proposal is accepted, the faculty member becomes the sponsor and supervises the research and writing of the project. When the project is completed and written, it must be submitted to and accepted by a committee of two individuals, consisting of the faculty advisor and one additional reader. The additional reader will be chosen appropriately from within the graduate program faculty or outside of it. Either the advisor or the additional reader must be from within the graduate program faculty.

Normative Time to Degree

The normative time to the M.S. degree (for students enrolled full-time) is two academic years.

Review of Progress

Students will be admitted to the M.S. program, not to the research group of any individual faculty member. However, each student will be matched with a first-year mentor, to ensure that adequate guidance is provided in the crucial first year of graduate school. In the second year, the role of the mentor will be played by the M.S. project advisor. Faculty advisors will be responsible for charting the progress of their students on a regular basis, and for making necessary adjustments to their plan of study and research.

The graduate program faculty will meet in the spring quarter of each academic year to review the performance of all students in the program. Based on the results from the faculty review, a written report will be provided to each student with an assessment of her/his performance and description of specific program objectives for the following academic year.

Transfer Credit

Up to three School of Engineering courses fulfilling the degree requirements of the M.S. degree may be taken

before beginning the graduate program through the concurrent enrollment program. Courses from other institutions may not be applied to the M.S. degree course requirements.

Students who complete the M.S. degree in statistical science and continue onto the Ph.D. program in statistical science can transfer all applicable courses taken during the M.S. to the Ph.D. program, provided that such students meet the minimum residency requirement for Ph.D. programs at UC Santa Cruz, as specified by the UCSC Graduate Division.

Applying for Graduation

All candidates for a degree must submit an Application for Master's Degree to the Graduate Student Affairs office by the date stated in the Academic and Administrative Calendar for the quarter they wish to receive the degree. The deadline for degree applications is typically in the second week of the quarter.

STATISTICAL SCIENCE PH.D.

Introduction

Students in the statistical science program learn to develop and use statistical methods to provide a probabilistic assessment of the variability in different data structures. This knowledge is applied to the quantification of the uncertainties inherent in the discoveries, summaries and conclusions that are drawn from the data analysis. The Ph.D. program provides mastery of fundamental concepts in statistical theory and methods, as well as analytical and computational skills to build modern statistical models, implement them, and effectively communicate their results. Through the process of learning these skills, the students develop the ability to conduct independent research.

Students will obtain a Ph.D. in statistical science. More specifically, students will develop background on statistical theory, methods, and computing through the program coursework, with research emphasis on novel methods and applications.

Undergraduate preparation for admission

We will accept students with undergraduate degrees in fields that include computer science, engineering, mathematics, natural sciences, physics, and statistics, subject to appropriate course requirements in statistics and mathematics. Undergraduate preparation in mathematics and statistics should include:

- single variable and multivariate differential and integral calculus (UC Santa Cruz equivalent AM 11A, AM 11B or MATH 19A, MATH 19B, and MATH 23A, MATH 23B);
- linear algebra (UCSC equivalent AM 10 or MATH 21); introductory statistics (UCSC equivalent STAT 5 or STAT 7); and

- introductory calculus-based probability and statistical inference (UCSC equivalent STAT 131 and STAT 132).

Relationship of M.S. and Ph.D. programs

The M.S. and Ph.D. programs are freestanding and independent, so that students can be admitted to either. Students completing the M.S. program may proceed into the Ph.D. program upon successful completion of the pre-qualifying examination, and application to the graduate committee and acceptance. Students in the Ph.D. program have the option of receiving the M.S. degree upon completion of the M.S. program requirements, including the capstone research project. Ph.D. core courses STAT 205B and STAT 206B can be used in place of STAT 205 and STAT 206, respectively, to fulfill the M.S. degree course requirements.

Advancement to Candidacy

Course Requirements

Nine core courses

Ph.D. students must complete nine core courses: seven 5-credit courses; a 3-credit course on research and teaching (STAT 200); and a 2-credit research seminar (STAT 280B). Ph.D. students must complete four additional 5-credit courses from the approved list of elective courses, bringing the total non-seminar credit requirements to 58 credits. None of the additional elective courses required to satisfy the credit requirements for the Ph.D. program can be substituted by independent study courses (Independent Study/Research or Thesis Research).

Students in the Ph.D. program must take the following nine core courses:

STAT 200	Research and Teaching in Statistics	3
STAT 203	Introduction to Probability Theory	5
STAT 204	Introduction to Statistical Data Analysis	5
STAT 205B	Intermediate Classical Inference	5
STAT 206B	Intermediate Bayesian Inference	5
STAT 207	Intermediate Bayesian Statistical Modeling	5
STAT 208	Linear Statistical Models	5
STAT 209	Generalized Linear Models	5
STAT 280B	Seminars in Statistics	2

5-credit core courses

All core courses are 5-credit courses, except for STAT 200 and STAT 280B. STAT 200 is a 3-credit course which covers basic teaching techniques for teaching assistants, and examines research and professional training items, as well as ethical issues relating to research in science and engineering. STAT 280B is a 2-credit seminar course, which involves attending the Statistics Department colloquia and participating in the

discussion session after the seminar presentation. The strict requirement for STAT 280B is for students to take it once in their first year in the program. However, students are strongly recommended to take STAT 280B each quarter throughout their graduate studies.

All core courses must be taken for a letter grade (except for STAT 200 and STAT 280B, which are given on a satisfactory/unsatisfactory basis). In order to maintain a full load for graduate standing after their first year, students take additional courses, including independent study courses, from the approved list of elective courses, appropriate to their research interests and selected in consultation with their advisors.

Electives available to PhD students include:

STAT 202	Linear Models in SAS	5
STAT 209	Generalized Linear Models	5
STAT 222	Bayesian Nonparametric Methods	5
STAT 223	Time Series Analysis	5
STAT 224	Bayesian Survival Analysis and Clinical Design	5
STAT 225	Multivariate Statistical Methods	5
STAT 226	Spatial Statistics	5
STAT 227	Statistical Learning and High Dimensional Data Analysis	5
STAT 229	Advanced Bayesian Computation	5
STAT 243	Stochastic Processes	5
STAT 244	Bayesian Decision Theory	5
STAT 246	Probability Theory with Markov Chains	5
AM 216	Stochastic Differential Equations	5
AM 230	Numerical Optimization	5
AM 250	An Introduction to High Performance Computing	5
CSE 242	Machine Learning	5
CSE 243	Data Mining	5
CSE 249	Large-Scale Web Analytics and Machine Learning	5
CSE 272	Information Retrieval	5
CSE 277	Random Process Models in Engineering	5
ECE 253	Introduction to Information Theory	5
ECE 256	Statistical Signal Processing	5
ECON 211A	Advanced Econometrics I	5
ECON 211B	Advanced Econometrics II	5
ENVS 215A	Geographic Information Systems and Environmental Applications	5
ENVS 215L	Exercises in Geographic Information Systems	2
MATH 204	Analysis I	5
MATH 205	Analysis II	5
MATH 208	Manifolds I	5

ENVS 215L is the concurrent lab to ENVS 215A. The lecture/lab combination counts as one course.

Foreign Language Requirements

Teaching Requirements

Ph.D. students are required to serve as teaching assistants for at least one quarter during their graduate study. Certain exceptions may be permitted for those with extensive prior teaching experience, for those who are not allowed to be employed due to visa regulations, or for other reasons approved by the director of graduate studies.

Pre-Qualifying Requirements

At the end of the first year, Ph.D. students take a pre-qualifying examination covering the six 5-credit core courses: STAT 203, STAT 204, STAT 205B, STAT 206B, STAT 207 and STAT 208. This examination comprises two parts: an in-class written examination, followed by a take-home project involving data analysis. Students who do not pass this examination can retake it before the start of the following fall quarter; if they fail the second examination they are dismissed from the Ph.D. program, but have the option to continue in the M.S. program.

Qualifying Examination

Ph.D. students must complete the qualifying examination (advancement to candidacy) requirement by the end of the spring quarter of their third year. Ph.D. students must select a research advisor by the end of their second year in the program. A written dissertation proposal must be submitted to the advisor, and filed with the Graduate Student Affairs Office. A qualifying examination committee will be formed, consisting of the advisor and at least three additional members, approved by the director of graduate studies and the dean of the Graduate Division. The following conditions must be met for the examination committee:

1. The chair of the qualifying examination committee must be a tenured faculty from within the graduate program faculty. The committee chair can not be the student's advisor or one of her/his co-advisors.
2. For students with a single advisor, or two co-advisors one of which is from outside the graduate program faculty, the committee must include at least two members from within the graduate program faculty other than the advisor or co-advisor. For students with two co-advisors that are both members of the graduate program faculty, the committee must include at least one additional member from within the graduate program faculty.
3. The committee must include at least one member from outside the graduate program faculty, for which the Senate Regulations for committee membership apply. The outside member can be the student's advisor or co-advisor.

The student submits the written dissertation proposal to all members of the committee no less than one month in advance of the qualifying examination. The dissertation proposal is formally presented in a public oral qualifying examination with the committee, followed by a private examination. Students will advance to candidacy after they have completed all course requirements (including removal of any incompletes), passed the qualifying examination, nominated a dissertation reading committee, and paid the advancement to candidacy fee. Under normal progress, a student will advance to candidacy by the end of the spring quarter of her/his third year. A student who has not advanced to candidacy by the start of the fourth year will be subject to academic probation.

Post-Qualifying Requirements

[Optional Catchall]

Dissertation

Dissertation

Upon advancement to candidacy, a dissertation reading committee is formed, consisting of the dissertation advisor (co-advisors) who serve as the chair (co-chairs) of the committee, and at least two additional readers. Therefore, the minimum number of dissertation reading committee members is three (four) for students with a single advisor (two co-advisors). For students with a single advisor, or two co-advisors one of which is from outside the graduate program faculty, the committee must include at least two additional readers from within the graduate program faculty. For students with two co-advisors that are both members of the graduate program faculty, the committee must include at least one additional reader from within the graduate program faculty. The committee is subject to the approval of the graduate director and of the Graduate Division. The Ph.D. dissertation should consist of a minimum of three chapters composed of material suitable for publication in major professional journals in statistics and journals in relevant scientific fields where the statistical methodology is applied.

Dissertation Defense

The completed dissertation must be submitted to the reading committee at least one month before the dissertation defense, which consists of a public presentation of the research followed by a private examination by the reading committee. Successful completion of the dissertation defense is the final requirement for the Ph.D. degree.

Academic Progress

Students will be admitted to the Ph.D. program, not to the research group of any individual faculty member. However, each student will be matched with a first-year mentor, to ensure that adequate guidance is provided in the crucial first year of graduate school. In later years, the

role of the mentor will be played by the Ph.D. dissertation advisor. Faculty advisors will be responsible for charting the progress of their students on a regular basis, and for making necessary adjustments to their plan of study and research.

The graduate program faculty will meet in the spring quarter of each academic year to review the performance of all students in the program. Based on the results from the faculty review, a written report will be provided to each student with an assessment of her/his performance and description of specific program objectives for the following academic year.

The normative pre-candidacy period for Ph.D. students (enrolled full-time) is three years and the normative candidacy period is two years, for a total of five years to the Ph.D. degree.

Transfer Credit

Up to three School of Engineering courses fulfilling the degree requirements of the Ph.D. degree may be taken before beginning the graduate program through the concurrent enrollment program. Ph.D. students who have previously earned a M.S. degree in a related field at another institution may substitute courses from their previous university with approval of the advisor and the graduate committee. Petitions should be submitted along with the transcript from the other institution or UC Santa Cruz Extension. For courses taken at other institutions, copies of the syllabi, examinations, and other course work should accompany the petition. Such petitions are not considered until the completion of at least one quarter at UCSC. At most, a total of three courses may be transferred from concurrent enrollment and other institutions.

Applying for Graduation

All candidates for a degree must submit an Application for Doctor of Philosophy Degree to the Graduate Student Affairs office by the date stated in the Academic and Administrative Calendar for the quarter they wish to receive the degree. The deadline for degree applications is typically in the second week of the quarter.

STATISTICS DESIGNATED EMPHASIS

Introduction

Students from a Ph.D. degree program, other than statistical science, who meet the following requirements can have the designated emphasis of “statistics” annotated to their degree title. For example, a Ph.D. student in electrical engineering who meets the requirements would receive a diploma that reads “Ph.D. Electrical Engineering with an emphasis in (Statistics).”

Requirements

Committee Composition and Departmental

Approvals

Upon electing to pursue a designated emphasis (DE) in statistics, students must choose a DE faculty advisor in the Statistics Department. A list of eligible DE advisors is maintained online. The student must organize a preliminary meeting with the DE advisor, and agree on a plan for completion of the requirements. Once this plan has been designated, the student and the DE advisor must complete the Application for a Designated Emphasis in Statistics form. The completed application form should be signed by the student's home department advisor, the DE advisor, and the statistics graduate director, and then filed with the BSOE Graduate Student Affairs Office (bsoe-ga@rt.ucsc.edu). This should be done before the student's advancement to candidacy (for Ph.D. students).

Course Requirements

Both these courses

STAT 203	Introduction to Probability Theory	5
STAT 207	Intermediate Bayesian Statistical Modeling	5

Plus one of these courses

STAT 206	Applied Bayesian Statistics	5
STAT 206B	Intermediate Bayesian Inference	5

Plus one other statistics course from the following list of approved courses

STAT 204	Introduction to Statistical Data Analysis	5
STAT 205	Introduction to Classical Statistical Learning	5
STAT 205B	Intermediate Classical Inference	5
STAT 208	Linear Statistical Models	5
STAT 209	Generalized Linear Models	5
STAT 222	Bayesian Nonparametric Methods	5
STAT 223	Time Series Analysis	5
STAT 225	Multivariate Statistical Methods	5
STAT 226	Spatial Statistics	5
STAT 227	Statistical Learning and High Dimensional Data Analysis	5
STAT 229	Advanced Bayesian Computation	5
STAT 243	Stochastic Processes	5
STAT 244	Bayesian Decision Theory	5
STAT 246	Probability Theory with Markov Chains	5
STAT 291	Advanced Topics in Bayesian Statistics	3

Students can take either STAT 205 or STAT 205B.

Writing, Research and/or Teaching Requirements

[Optional Catchall]

DATA SCIENCE DESIGNATED EMPHASIS

Introduction

The Data Science Designated Emphasis is a non-degree program housed in the Department of Statistics of the Baskin School of Engineering at the University of California, Santa Cruz. The program aims to provide Ph.D. students from a wide swath of graduate degree programs across campus with the training required to apply state-of-the-art methods and tools from data wrangling, data visualization, statistical data analysis, machine learning, and artificial intelligence to their own research.

Requirements

Committee Composition and Departmental Approvals

Students must include one of the Data Science program faculty members that is not a member of their home department in their qualifying exam and dissertation committees. This faculty member is the "DE advisor" for purposes of the designated emphasis. This faculty member must be identified at the time the student applies to the program. A list of current program faculty can be found at the program faculty website the program faculty website.

The student must organize a preliminary meeting with the DE advisor, and agree on a plan for completion of the requirements. Once this plan has been designated, the student and the DE advisor must complete the Application for a Designated Emphasis in Data Science form. The completed application form should be signed by the student's home department advisor, the DE advisor, and the DE executive committee chair, and then filed with the BSOE Graduate Student Affairs Office (bsoe-ga@rt.ucsc.edu). This must be done before the student's advancement to candidacy.

Course Requirements

Required Courses

All students in the designated emphasis are required to complete 18 credits in mandatory courses covering the following topics:

Data Wrangling and Visualization

STAT 266A	Data Visualization and Statistical Programming in R	3
STAT 266C	Introduction to Data Wrangling	3

Statistical Data Analysis

STAT 204	Introduction to Statistical Data Analysis	5
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Machine Learning

CSE 242	Machine Learning	5
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Speaker Series

STAT 280B	Seminars in Statistics	2
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Elective Courses

In addition to completing all required courses, all students must complete at least one five-credit elective from the list below. Students may not double-count a course that is required for their main program as an elective for the Data Science DE.

Applied Mathematics

AM 229	Convex Optimization	5
AM 230	Numerical Optimization	5
AM 250	An Introduction to High Performance Computing	5

Astronomy and Astrophysics

ASTR 234	Statistical Techniques in Astronomy	5
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Computational Media

CMPM 243	Social Computing Research: Design, Algorithms, and Incentives	5
CMPM 268	Immersive Analytics	5

Computer Science and Engineering

CSE 243	Data Mining	5
CSE 248	Foundations of Data Science	5
CSE 261	Advanced Visualization	5

Economics

ECON 211A	Advanced Econometrics I	5
ECON 211B	Advanced Econometrics II	5
ECON 211C	Advanced Econometrics III	5

Electrical and Computer Engineering

ECE 237	Image Processing and Reconstruction	5
ECE 250	Digital Signal Processing	5
ECE 253	Introduction to Information Theory	5
ECE 256	Statistical Signal Processing	5

Environmental Studies

ENVS 215A	Geographic Information Systems and Environmental Applications	5
ENVS 215B	Intermediate Geographic Information Systems	5

Ocean Sciences

OCEA 260	Introductory Data Analysis in the Ocean and Earth Sciences	5
OCEA 267	Applied Environmental Time Series Analysis	5

Psychology

PSYC 204	Quantitative Data Analysis	5
PSYC 205	Categorical Data Analysis	5
PSYC 214A	Multivariate Techniques for Psychology	5
PSYC 214B	Advanced Multivariate Techniques for Psychology	5

Statistics

STAT 203	Introduction to Probability Theory	5
STAT 205	Introduction to Classical Statistical Learning	5
STAT 206	Applied Bayesian Statistics	5
STAT 207	Intermediate Bayesian Statistical Modeling	5
STAT 208	Linear Statistical Models	5
STAT 209	Generalized Linear Models	5
STAT 222	Bayesian Nonparametric Methods	5
STAT 223	Time Series Analysis	5
STAT 224	Bayesian Survival Analysis and Clinical Design	5
STAT 225	Multivariate Statistical Methods	5
STAT 226	Spatial Statistics	5
STAT 227	Statistical Learning and High Dimensional Data Analysis	5
STAT 229	Advanced Bayesian Computation	5

Writing, Research and/or Teaching Requirements**[Optional Catchall]****Technology and Information Management**

Baskin School of Engineering
(831) 459-2158
<https://www.soe.ucsc.edu>

PROGRAMS OFFERED

Technology Information Management B.S. (p. 540)

Technology Information Management Minor (p. 545)

Technology and Information Management (TIM) is a multi-disciplinary program that focuses on the integration of engineering, computer science, and economics for two purposes: the technology of management, which includes the design of information technology to solve business problems; and the management of technology, which includes the management, development, and

commercialization of products, innovation, and entrepreneurship. The program offers a bachelor of science (B.S.) degree in technology and information management (TIM) as well as a minor in technology and information management (TIM).

TECHNOLOGY AND INFORMATION MANAGEMENT B.S.

Information and Policies

Introduction

Technology and Information Management (TIM) is a rigorous, challenging major for those students wanting to pursue careers in the management of information and technology. TIM students will receive a thorough grounding in the fundamental principles and practices of technology (in particular, computer science and computer engineering) and management, and the scientific, mathematics, and economics principles upon which they are built. In particular, they will become proficient in the following areas: strategy, planning, innovation, entrepreneurship, information technology, software design, product development, and supply-chain management.

The essence of the technology and information management major at UCSC is the integration of fundamental intellectual content from the disciplines of computer science, computer engineering, business management economics, and finance. TIM students learn how to apply the fundamentals of these diverse disciplines to solving problems that require the integration of management and technology, e.g., developing information technology systems to manage all activities and operations in a firm, e-commerce, managing and commercializing a new technology, and starting a new high-technology company.

To graduate with a B.S. in technology and information management, students normally complete 26 required courses (with two laboratories, totaling 129 quarter credits) plus three elective courses (15 quarter credits) for the technology and information management major program. Honors students are likely to find the rigorous management and leadership elements of the program of significant interest. Industrial interactions and projects are key features of this major.

Academic Advising for the Program

The Baskin School of Engineering undergraduate advising office offers general advising for prospective and declared undergraduates majoring in School of Engineering programs. The office handles major declarations, transfer credits, course substitutions, articulations, and degree certifications. Undergraduate students obtain and submit all paperwork requiring departmental approval to the undergraduate advising

office. Transfer students should also refer to the Transfer Information and Policy section.

Baskin Engineering Building, Room 225
bsoeadvising@ucsc.edu
(831) 459-5840

Getting Started in the Major

The technology and information management major is intended for students with an interest in both technology and business. It is recommended that students intending to declare this major have completed four years of mathematics (through advanced algebra and trigonometry) and three years of science in high school. Completion of business-oriented computer literacy and basic programming courses is of benefit to students entering this major. Completion of any economics and/or business-related courses in high school is also beneficial, but the faculty realizes that these courses may not be available at many high schools. Completion of comparable college courses at other institutions serves to strengthen the preparation of a student for the technology and information management major.

Program Learning Outcomes

Students graduating from the TIM program will acquire the following:

1. Students will learn how to apply knowledge of engineering, economics, and mathematics to analyze complex problems in the management of technology and information science.
2. Students will develop a broad, interdisciplinary knowledge of problems in the management of technology and information science, and skills to address them.
3. Students will develop depth of expertise in the management of technology and information science.
4. Students will be able to collaborate and communicate effectively with individuals who have diverse ideas, expertise, and skill levels within the fields of management of technology and information science.

Major Qualification Policy and Declaration Process

Major Qualification

In order to be admitted into the technology and information management major students must be listed as a proposed major within the School of Engineering. Please refer to the School of Engineering's "Proposed Major Retention" and its "Declaring a School of Engineering Major" sections in the catalog for more information.

In addition, to be admitted to the TIM major after a student has entered UCSC, students need to complete a total of six courses chosen from the following:

Mathematics

At least one of the following:

One of these courses

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 20A or one of these courses	Honors Calculus	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 20B or one of these courses	Honors Calculus	5
MATH 22	Introduction to Calculus of Several Variables	5
MATH 23A	Vector Calculus	5
AM 30	Multivariate Calculus for Engineers	5
or this course		
CSE 16	Applied Discrete Mathematics	5

Engineering

At least one course from the following:

CSE 12	Computer Systems and Assembly Language	5
CSE 13S	Computer Systems and C Programming	7
CSE 30	Programming Abstractions: Python	7

Lecture/lab combinations count as one course.

Students with no prior programming will take CSE 20 before CSE 30 and CSE 12.

Economics and Technology and Information Management

At least one additional course must be chosen from the following:

ECON 1	Introductory Microeconomics: Resource Allocation and Market Structure	5
ECON 2	Introductory Macroeconomics: Aggregate Economic Activity	5
ECON 10A	Economics of Accounting	5
TIM 50	Business Information Systems	5

Three additional courses

At least three additional courses must be chosen from the following:

CSE 12	Computer Systems and Assembly Language	5
CSE 13S	Computer Systems and C Programming	7
CSE 30	Programming Abstractions: Python	7
CSE 16	Applied Discrete Mathematics	5
TIM 50	Business Information Systems	5
ECON 1	Introductory Microeconomics: Resource Allocation and Market Structure	5
ECON 2	Introductory Macroeconomics: Aggregate Economic Activity	5
ECON 10A	Economics of Accounting	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 20A	Honors Calculus	5
MATH 20B	Honors Calculus	5
MATH 22	Introduction to Calculus of Several Variables	5
MATH 23A	Vector Calculus	5
AM 30	Multivariate Calculus for Engineers	5

Lecture/lab combinations count as one course.

Only one course from each of the following sets can be counted:

MATH 19A and MATH 20A

MATH 19B and MATH 20B

MATH 22 and MATH 23A and AM 30

Eligibility to qualify for the major

Students in their first six quarters who have completed at least six qualifying courses in the TIM major will need to meet the following:

1. Their cumulative GPA is at least 2.4 in all of the major qualification courses attempted.
2. They have no more than 7 credits resulting in grades of C-, D+, D, D-, F or NP among all of the TIM major qualification courses attempted.

Appeal Process

Students who are informed that they do not qualify for the the major may appeal this decision by submitting a

letter to the undergraduate director through the Baskin School of Engineering undergraduate advising office within 15 days from the date the notification was mailed. Within 15 days of receipt of the appeal, the department will notify the student, college, and Office of the Registrar of the decision.

How to Declare a Major

There are four steps to declaring a BSOE major. For a detailed guide to this process, please consult Baskin Engineering's Declare Your Major website.

Students should start the declaration of major process by completing Step One on the BSOE Declare Your Major website as soon as they complete the major qualification courses or reach their declaration deadline quarter, whichever comes first.

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed the major qualification courses.

Transfer Information and Policy

Transfer Admission Screening Policy

The requirements for transfer students are as follows:

- 1) Transfer students must have completed at least six of the lower-division courses from the list below.
- 2) A minimum cumulative GPA of 2.4 is required in all the lower-division courses taken from the list below.

Students who wish to graduate in two years are strongly recommended to complete all screening courses except TIM 50, CSE 12, and CSE 13S, as well as most general education requirements, before coming to UCSC.

Students should consult assist.org to determine which courses at other institutions in California are transferable to UCSC.

CSE 12	Computer Systems and Assembly Language	5
CSE 13S	Computer Systems and C Programming	7
CSE 30	Programming Abstractions: Python	7
CSE 16	Applied Discrete Mathematics	5
TIM 50	Business Information Systems	5
ECON 1	Introductory Microeconomics: Resource Allocation and Market Structure	5
ECON 2	Introductory Macroeconomics: Aggregate Economic Activity	5

ECON 10A	Economics of Accounting	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 20A	Honors Calculus	5
MATH 20B	Honors Calculus	5
MATH 22	Introduction to Calculus of Several Variables	5
MATH 23A	Vector Calculus	5
AM 30	Multivariate Calculus for Engineers	5

Lecture/lab combinations count as one course.

Only one course from each of the following sets can be counted:

MATH 19A and MATH 20A

MATH 19B and MATH 20B

MATH 22 and MATH 23A and AM 30

Getting Started at UCSC as a Transfer Student

Transfer students should declare their major in their first quarter at UC Santa Cruz. Instructions for declaring a major in the Baskin School of Engineering are on the department's website.

Letter Grade Policy

All students admitted to a School of Engineering major, or seeking admission to a major, must take all courses required for that major for a letter grade. This policy includes courses required for these degrees that are sponsored by other departments.

School of Engineering Policies

Please refer to the School of Engineering section of the catalog for additional policies that apply to all School of Engineering programs. These policies include admission to the major and the need for UC Santa Cruz students to obtain pre-approval before taking courses elsewhere.

Course Substitution Policy

Undergraduate engineering students who wish to substitute a major course with a course from another department at UC Santa Cruz, or from another academic institution, must first consult the School of Engineering Undergraduate Advising Office. The advising office requires a Petition for Course Substitution be approved before credit for an alternate course can be applied to any School of Engineering major requirement.

Petition forms are available at the undergraduate advising office and online.

Petitions and procedures for approval must be obtained from and submitted to the Undergraduate Advising Office.

Double Majors and Major/Minor Combinations Policy**Study Abroad****Honors**

The TIM program awards honors to students whose academic performance is excellent. Students with a GPA 3.5 or higher but lower than 3.7 will be awarded honors. Students with a GPA of 3.7 or higher will be awarded highest honors. Students who have been found guilty of academic misconduct are not eligible for either honors or highest honors.

[Optional Catchall]**Requirements and Planners****Course Requirements****Lower-Division Courses****Statistics****Both of the following**

STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

Mathematics**One of the following options**

Either these courses		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

or these courses

MATH 20A	Honors Calculus	5
MATH 20B	Honors Calculus	5

Plus one of the following

AM 30	Multivariate Calculus for Engineers	5
MATH 22	Introduction to Calculus of Several Variables	5
MATH 23A	Vector Calculus	5

Plus one of the following options

Either these courses		
AM 10	Mathematical Methods for Engineers I	5
AM 20	Mathematical Methods for Engineers II	5

or these courses

MATH 21	Linear Algebra	5
MATH 24	Ordinary Differential Equations	5

Economics**All of the following**

ECON 1	Introductory Microeconomics: Resource Allocation and Market Structure	5
ECON 2	Introductory Macroeconomics: Aggregate Economic Activity	5
ECON 10A	Economics of Accounting	5

Computer Science and Engineering**All of the following**

CSE 12	Computer Systems and Assembly Language	5
CSE 13S	Computer Systems and C Programming	7
CSE 16	Applied Discrete Mathematics	5
CSE 20	Beginning Programming in Python	5
CSE 30	Programming Abstractions: Python	7

Students with no prior programming will take CSE 20 before CSE 30 and CSE 12. Students with a prior programming course, AP credit, or clearing the "Test-out" bar will start with CSE 30 and CSE 12.

Plus these courses

TIM 50	Business Information Systems	5
TIM 58	Systems Analysis and Design	5

Upper-Division Courses**Computer Science and Engineering**

All of the following:

CSE 150	Introduction to Computer Networks	5
CSE 150L	Introduction to Computer Networks Laboratory	2
TIM 170	Management of Technology Seminar	2
TIM 172A	Introduction to Management of Technology I	5
TIM 172B	Introduction to Management of Technology II	5
TIM 172P	Management of Technology Project I	3

TIM 172Q	Management of Technology Project II	3
TIM 175	Business Strategy and Information Systems	5
CSE 182	Introduction to Database Management Systems	5

the technology of management consists of a five-credit project-intensive course, TIM 175.

TIM 172A addresses strategic, engineering, marketing, and financial processes and tools for the management, development, and commercialization of high-tech products.

Economics

One of the following courses

ECON 100A	Intermediate Microeconomics	5
ECON 100M	Intermediate Microeconomics, Math Intensive	5

TIM 172B addresses the development and application of processes and tools for the management, design, optimization, and operation of supply chain networks for high-tech products.

TIM 172P is the first of a two-course project sequence in which students apply the knowledge and skills gained in TIM 172A to complete the first part of a major quarter-long comprehensive team project in the management of technology. In this course, taken concurrently with TIM 172A, the team project focus is on the management, design, and commercialization of a new product within a high-tech company. TIM 172A and TIM 172P together form the first part of the required management of technology comprehensive requirement for the TIM B.S. major.

Plus the following

ECON 113	Introduction to Econometrics	5
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Electives

Two 5-credit School of Engineering courses

Students select two upper-division School of Engineering electives on the basis of their particular interests. These electives may be any 5-credit upper-division or graduate School of Engineering courses, with the following limitations:

- Either STAT 131 or CSE 107, but not both;
- At most, one independent or field-study course (CSE 193, CSE 195, CSE 198, CSE 199) with prior approval from the department to be used as an elective.

TIM 172Q is the second of a two-course project sequence in which students apply the knowledge and skills gained in TIM 172B to complete the second part of a major comprehensive team project in the management of technology. In this course, taken concurrently with TIM 172B, the team project focus is on the supply chain management for the new product developed in the project course TIM 172P. TIM 172B and TIM 172Q together form the second part of the required management of technology comprehensive requirement for the TIM B.S. major.

TIM 175 requires that students understand and use a structured methodology to evaluate the competitive use of information systems within an enterprise. This is accomplished by a team project as well as by an individual project that involves researching and writing a comprehensive analytical term paper using a methodology taught as part of this course.

Plus

One 5-credit, upper-division economics course

A list of suggested economics courses can be found on the Technology and Information curriculum chart on the Baskin Engineering Undergraduate Affairs Major Curriculum page.

TIM 172A	Introduction to Management of Technology I	5
TIM 172B	Introduction to Management of Technology II	5
TIM 172P	Management of Technology Project I	3
TIM 172Q	Management of Technology Project II	3
TIM 175	Business Strategy and Information Systems	5

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement in technology and information management is satisfied by completing TIM 175.

TIM 175	Business Strategy and Information Systems	5
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Comprehensive Requirement

Students complete the comprehensive requirement in two areas, the management of technology and the technology of management. The comprehensive requirement in the management of technology consists of two five-credit courses, TIM 172A and TIM 172B, and two three-credit project courses, TIM 172P and TIM 172Q. TIM 172A and TIM 172P need to be taken concurrently, as do TIM 172B and TIM 172Q. The comprehensive requirement in

Planners

The following are two sample academic plans for students pursuing the technology and information management major. Plan One is for first-year students, and Plan Two is designed for transfer students that have completed all general education requirements. Students completing the courses in the four-year planner will have

satisfied the MF, PE and SR General Education requirements.

Four-Year Major Planner

	Fall	Winter	Spring
1st (frosh)	MATH 19A	MATH 19B	ECON 1
	ECON 10A	CSE 20	CSE 30
2nd (soph)	TIM 50	ECON 2	STAT 7 & STAT 7L
	AM 10	MATH 22 or MATH 23A	ECON 100A
	CSE 13S	CSE 150 & CSE 150L	CSE 12
3rd (junior)	CSE 16	TIM 58	CSE 182
	TIM 172A & TIM 172P	TIM 172B & TIM 172Q	AM 20
4th (senior)	ECON 113	BSOE elective	TIM 175
		ECON elective	BSOE elective

Two-Year Transfer Major Planner*

	Fall	Winter	Spring
1st (junior)	TIM 50	TIM 58	TIM 170
	ECON 100A	CSE 12	CSE 150 & CSE 150L
2nd (senior)	TIM 172A & TIM 172P	TIM 172B & TIM 172Q	ECON 113
	BSOE elective	ECON elective	TIM 175
	CSE 13S		BSOE elective
			CSE 182

*This plan assumes that transfer students have completed all of their lower-division courses for the technology and information management major, with the exception of

CSE 12, CSE 13S, TIM 50 and TIM 58, prior to attending UCSC.

Curriculum charts for all BSOE majors are available at the Baskin Engineering Undergraduate Affairs website.

TECHNOLOGY AND INFORMATION MANAGEMENT MINOR

Course Requirements

Lower-Division Courses

Mathematics (2 Courses)

One of the following

AM 11A	Mathematical Methods for Economists I	5
MATH 11A	Calculus with Applications	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 20A	Honors Calculus	5

Plus one of the following

AM 11B	Mathematical Methods for Economists II	5
MATH 11B	Calculus with Applications	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 20B	Honors Calculus	5

Computer Science and Engineering (3 Courses)

One of the following

CSE 20	Beginning Programming in Python	5
CSE 30	Programming Abstractions: Python	7

Plus the following course

CSE 50	Business Information Systems	5
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Plus one of the following options

TIM 58	Systems Analysis and Design	5
TIM 80C	Starting a New Technology Company	5

Upper-Division Courses

Mathematics (1 Course)

One of the following courses:

CSE 107	Probability and Statistics for Engineers	5
ECON 113	Introduction to Econometrics	5

STAT 131	Introduction to Probability Theory	5
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Electives (4 Courses)

Four courses from the following list:

CSE 171A	Introduction to Management of Technology I	5
CSE 171B	Introduction to Management of Technology II	5
CSE 175	Business Strategy and Information Systems	5
CSE 150	Introduction to Computer Networks	5
CSE 150L	Introduction to Computer Networks Laboratory	2
CSE 180	Database Systems I	5
CSE 182	Introduction to Database Management Systems	5
ECON 100A	Intermediate Microeconomics	5
ECON 100M	Intermediate Microeconomics, Math Intensive	5
ECON 100B	Intermediate Macroeconomics	5
ECON 100N	Intermediate Macroeconomics, Math Intensive	5

Lecture/lab combinations count as one course.

Either CSE 180 or CSE 182

Either ECON 100A or ECON 100M

Either ECON 100B or ECON 100N

SOCIAL SCIENCES DIVISION

460 Humanities and Social Sciences Building
(831) 459-3212
<http://socialsciences.ucsc.edu/>

The Division of Social Sciences focuses on the study of human relationships and society. As global economic and political changes transform the world around us, social scientists help us meet the challenges and opportunities of the 21st century.

Our eight departments offer more than 30 undergraduate and graduate degree programs, including many that are interdisciplinary collaborations. Our faculty members conduct leading-edge research in their fields, frequently working with students in research clusters linking departments to our research centers. We also offer extensive opportunities for experiential learning through field studies.

Our research, teaching, and state-of-the-art facilities provide students with a comprehensive and rigorous education that prepares them for productive careers and further academic pursuits. For more information on the division, see our website.

Anthropology

361 Social Sciences 1 Building
(831) 459- 3320
<https://anthro.ucsc.edu/>

PROGRAMS OFFERED

Anthropology B.A. (p. 548)

Anthropology Minor (p. 553)

Anthropology Ph.D. (p. 553)

Anthropology Designated Emphasis (p. 558)

OTHER PROGRAMS OF INTEREST

Earth Sciences/Anthropology B.A. (p. 286)

Anthropology is the study of people throughout the world and through time. Because it covers a wide range of topics—biological evolution, material remains of the past, and the world that humans create through their ideas and practices in present-day societies—anthropology is an especially integrative discipline. The anthropology program at UC Santa Cruz offers courses that reflect the diversity of the field.

- Cultural anthropology explores the everyday lives, beliefs, activities, and movements of people, objects, and ideas in diverse societies. Cultural anthropology courses examine such topics as race and ethnicity, medicine, health, science, gender,

sexuality, environment, religion, law, popular culture, politics, economics, and institutions.

- Archaeology uses the material evidence of human activities to understand past human lives. Archaeology at UCSC focuses on past people's interactions with one another at the local level and within their wider social and ecological contexts. Faculty research areas include the pre-colonial and early post-colonial history of Africa, Mesoamerica, the Caribbean, and western North America.
- Biological anthropology traces the human journey from its beginnings in Africa over five million years ago. Biological anthropology courses look at fossil evidence, evolutionary theory, human variation, and the behavior of primate relatives in order to analyze biological, social, and cultural changes over time. Biological anthropology at UCSC has a methodological emphasis in innovative approaches to human and non-human primate ecology and diversity founded on our expertise in genomics, isotope biochemistry, as well as human osteology.

UCSC students have the opportunity to do independent library and field research in cultural anthropology, archaeology, and biological anthropology. Laboratory courses in archaeology and biological anthropology offer practical experience in the analysis of biological and cultural materials. In cultural anthropology courses, students learn to carry out anthropological research through interviews, participant observation, surveys, the collection of oral histories, analysis of textual, visual, and aural materials, and the interpretation of archival materials.

Because anthropology is concerned with understanding human interaction, it is a useful major for anyone planning a career that involves working with people, especially those from diverse cultures. Some UCSC anthropology graduates are in social work, many are in teaching, and others pursue careers in law, city planning, politics, medicine, public health, cultural resource management, and journalism. Students intending to specialize in anthropology usually go on to graduate school because professional employment in the field almost always demands an advanced degree.

A combined major in Anthropology and Earth and Planetary Sciences, leading to a bachelor of arts (B.A.) degree, is also offered; for that program description, see Earth and Planetary Sciences.

Most anthropology faculty have their offices in Social Sciences 1 Building. Social Sciences 1 also houses laboratories for archaeology and biological anthropology where space is provided for laboratory and individual studies courses and for collections of human and non-human mammalian skeletal material, a variety of archaeological artifacts, and collaborative workspaces for cultural anthropology research.

The Anthropology Society, a campus club, is open to all students interested in anthropology. The Anthropology Colloquium series showcases guest speakers and gives faculty and students an opportunity to discuss new approaches to anthropological questions. Students and faculty interested in archaeology also gather informally at the Archaeology/Biological Anthropology Lunch forum to share information on fieldwork and employment opportunities.

ANTHROPOLOGY B.A.

Information and Policies

Introduction

The anthropology bachelor of arts (B.A.) incorporates the three anthropological subfields of anthropological archaeology, cultural anthropology, and biological anthropology, while providing undergraduates with a solid grounding in theory and methods.

Students do not declare an emphasis or concentration within the anthropology major. All students therefore are general anthropology majors and complete the same requirements. However, students can choose to take additional courses in a specific area of anthropology while completing the upper-division anthropology electives required for the major, or by choosing to take courses above and beyond what is required for the major.

Academic Advising for the Program

For more information regarding department policies, please consult the undergraduate coordinator at the Anthropology Department undergraduate advising web page.

All majors, including double majors, must prepare a program of study. This can be done in consultation with faculty or undergraduate coordinator. The Anthropology Department urges students to seek faculty advice early in planning for the major. Faculty hold regular office hours weekly and encourage students to come in to talk about their program, or coursework, and career and professional advising. Students planning to pursue graduate training should plan course schedules in close consultation with faculty advisors. Transfer students should consult the Transfer Information and Policy section of this program statement.

Peer Advisors

The Anthropology Department has instituted a peer advisor program as a supplement to academic advising offered by faculty members. The peer advisors are juniors and seniors who have been trained to help students with questions and general guidance through the anthropology major. Please consult the Anthropology Department undergraduate advising web page for scheduling with the peer advisors.

Getting Started in the Major

Program Learning Outcomes

A student who graduates with a B.A. in anthropology has the following knowledge and skills.

Core Concepts in Anthropology

The student demonstrates understanding of the core concepts in three primary subfields of anthropology: cultural anthropology, archaeology, and biological anthropology.

Knowledge of Cultural Differences

The student demonstrates knowledge of cultural variation and the diversity of perspectives, practices, and beliefs found within each culture and across cultures.

Integration of Subfields

The student integrates cultural, biological, and archaeological perspectives on human bodies, behavior, materialities, and institutions.

Written Communication

The student demonstrates the ability to write clearly by formulating well-organized arguments that are grounded in supporting evidence while countering evidence that contradicts the student's claims.

Oral Communication

The student is able to organize ideas and information and articulate them effectively.

Research and Analytical Skills

The student demonstrates knowledge of the basic steps involved in scholarly research, including locating and critically evaluating scholarly and other information sources relevant to the chosen topic. The student can recognize and demonstrate a basic understanding of research methods used in the various subfields of anthropology, including—but not limited to— participant observation, thick description, laboratory and field analysis, and interviewing.

Understanding of Long-Term Changes in Human Behavior and Conditions in Deep Time

The student has a grasp of long-term changes in the conditions that have shaped humans and the environments they inhabit.

Major Qualification Policy and Declaration Process

Major Qualification

In order to qualify for the major, students must have received a "C" or better in at least one lower-division anthropology course (ANTH 1, ANTH 2, or ANTH 3) and have either received a "C" or better in a second lower-division anthropology course or be enrolled in a

second lower-division anthropology course at the time of declaration. Transfer students should consult the Transfer Information and Policy section of this program statement.

Appeal Process

Students who are informed that they are not eligible to declare the major may appeal this decision by submitting a letter to the department chair within 15 days from the date the notification was mailed. Within 15 days of receipt of the appeal, the department will notify the student, college, and Office of the Registrar of the decision.

How to Declare a Major

Students should submit a petition to declare by completing the petition for major/minor declaration form as soon as they complete the major qualification courses or reach their declaration deadline quarter, whichever comes first.

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed major qualification courses.

STEP 1: Complete a Petition for Major/Minor Declaration.

- **Anthropology Majors/Minors Only:** The Petition for Major/Minor Declaration will be completed through DocuSign. **Students must be logged into the UCSC Google account in order to access the petition which is linked below.**
- The petition for major/minor declaration link will take you to a short form where you will be required to enter your full name and select the type of degree for which you are petitioning. Please make sure that you enter correct information as you will not be able to change it once the form is submitted. After you submit the form, you will be rerouted to DocuSign where you will complete the petition.
- DocuSign will prompt you to complete all required fields and ensure that fields are completed correctly.

The form will prompt you to enter your Expected Graduation Term (EGT). To view your EGT, go to your MyUCSC Student Center, click on “Student Advising Summary”, then click on the “Degree” tab – your EGT will be listed here. Please note that the EGT for most students reflects one extra quarter beyond what they will need to complete requirements. You do not need to have your EGT adjusted if you are planning to graduate before the term indicated; if you need to attend after this term, however, it is very important you contact your college to request an adjustment or extension.

- The completed petition will be routed automatically to the Anthropology Undergraduate Advising Office.

Anthropology Petition for Major/Minor Declaration

STEP 2: Start an Academic Planning Form from the UCSC Office of Campus Advising Coordination (or click on the image below).

[UCSC Academic Planning Form](#)

STEP 3: Make an appointment in Slug Success to meet an anthropology peer advisor or the anthropology undergraduate advisor to discuss your academic plan and major requirements.

STEP 4: Make an appointment in Slug Success to meet with the anthropology undergraduate advisor to complete the declaration process. Share your Academic Planning Form Google Doc with the anthropology undergraduate advisor. **It is very important that you complete this step, as you will not be declared until you do so!**

Recommended: Meet with a permanent anthropology faculty member to discuss your major plans and academic plan. It is best to meet with an anthropology faculty member during their quarterly office hours or email them to schedule an appointment. The Anthropology Department does not assign faculty advisors; we suggest that you meet with a faculty member whose work coincides with your interests. In addition to reviewing the required declaration paperwork, you should also talk with the faculty member about your intellectual and career interests, graduate school preparation, opportunities for experiential learning (e.g., internships or research), and options for satisfying the senior comprehensive requirement.

If you are a transfer student, you must provide the department with an unofficial copy of your transcript from any institution where you took anthropology courses that you would like to apply to the major

requirements. **Please do this as soon as possible as it may affect your enrollment in anthropology courses that have prerequisites.**

Transfer Information and Policy

Transfer Admission Screening Policy

Students planning to apply in this major are not required to complete specific major preparation courses for consideration of admission to UC Santa Cruz. Transfer students are strongly encouraged to complete ANTH 1, ANTH 2, and ANTH 3 before transferring to UCSC, however, it is not required for admission.

Getting Started at UCSC as a Transfer Student

Transfer Credit Toward Major/Minor Requirements

Students may transfer courses equivalent to ANTH 1, ANTH 2, and ANTH 3 from California community colleges and universities with existing articulation agreements (www.assist.org).

Students may also petition to transfer courses equivalent to ANTH 1, ANTH 2, and ANTH 3 from other community colleges or from four-year institutions.

Students may petition up to 10 quarter credits (equivalent to two UC Santa Cruz courses) of upper-division transfer credit toward the elective requirements under the following circumstances:

- A student has taken an upper-division anthropology course at another four-year university (including courses taken through study abroad) and wants to petition for the course to count toward the anthropology major or minor elective.
- A student was enrolled in an accredited Field School Program and wants to petition for the course to count toward the anthropology elective requirements.

Prior to Enrolling in Your First Quarter at UCSC

Complete Lower-Division Requirements

Most upper-division courses have one of the following lower-division introductory courses as a prerequisite:

- ANTH 1 Introduction to Biological Anthropology
- ANTH 2 Introduction to Cultural Anthropology
- ANTH 3 Introduction to Archaeology

Confirm Transfer Credit Has Been Processed

After you have been admitted to UCSC and all your final official transcripts from other colleges have been received, the Office of Admissions will evaluate your transfer credit. The evaluation shows which of your past courses are transferable to UCSC and how many credits you have accrued. It also shows which general education requirements you have satisfied, whether you have satisfied the Intersegmental General Education Transfer

Curriculum (IGETC), and whether you have satisfied the University of California Entry Level Writing and American History and Institutions requirements. Students access this information through MyUCSC by viewing the Academic Advisement Report from the "more links" drop-down menu in the Academics area of the Student Center. If this information is not available for your first enrollment period, contact a college or major advisor to help you select appropriate classes. It is an excellent idea to keep an unofficial copy of your transcripts from your previous schools. You should take these documents with you to all academic advising appointments.

Confirm Transfer Credit Articulates with UCSC Courses

Courses taken at community colleges or four-year universities may be used to satisfy the lower-division requirements for the major. View the UC Articulation Agreements to determine which California community college courses are equivalent to our ANTH 1, ANTH 2 and ANTH 3. **Please note that courses approved by the Office of Admissions for transfer credit do not necessarily satisfy major requirements. Courses must have an articulation agreement to count automatically toward major requirements.**

If your transfer credit course does not articulate with a UCSC course, you may submit a coursework petition. **Faculty are not appointed during summer, so fall admits will likely need to wait until after the beginning of fall quarter for coursework petitions to be approved.**

Enrolling in Your First Quarter at UCSC

We strongly recommend that transfer students take ANTH 150, Communicating Anthropology, during their first quarter at UCSC. This course is designed to provide transfer students with a transition to UCSC coursework. It emphasizes critical reading and writing skills and is an excellent foundation for further upper-division coursework. This class fulfills the anthropological theory core requirement.

We also recommend taking only one additional upper-division course in anthropology during your first quarter at UCSC. Most upper-division anthropology courses are offered only on an every-other-year basis. Transfer students are advised to plan accordingly.

“Free Quarter” for Transfer Students with Unarticulated, Lower-Division Courses

Any student who has taken a course analogous to ANTH 1, ANTH 2, or ANTH 3 will be issued a permission code by the undergraduate advisor for courses listing ANTH 1, ANTH 2, or ANTH 3 as a prerequisite (provided the class has not reached maximum enrollment) in their first quarter at UCSC. Students must provide unofficial transcripts as evidence that they have completed courses analogous to ANTH 1, ANTH 2, or ANTH 3.

If the student fails to petition for a course substitution during their first quarter, they must receive instructor

permission to enroll in courses with ANTH 1, ANTH 2, or ANTH 3 as prerequisites thereafter until the prerequisite is satisfied either by taking the class or approved course substitution petition.

Major Qualifications

In order to qualify for the major, students must have received a "C" or better in at least one lower-division anthropology course (ANTH 1, ANTH 2, or ANTH 3) and have either received a "C" or better in a second lower-division anthropology course or be enrolled in a second lower-division anthropology course at the time of declaration.

Letter Grade Policy

This program does not have a letter grade policy.

[Optional Catchall]

Course Substitution Policy

Courses from California Community Colleges

Courses taken at community colleges or four-year universities may be used to satisfy the lower-division requirements for the major. View the UC Articulation Agreements to determine which California community college courses are equivalent to our ANTH 1, ANTH 2, and ANTH 3.

Courses from Other Four-Year Universities

The Anthropology Department may also accept introductory anthropology courses equivalent to ANTH 1, ANTH 2 and ANTH 3 from other four-year universities but students must petition to have these courses count toward the anthropology major or minor requirements.

You may also apply up to 10 credits (two classes) of upper-division credit toward the major. These credits must be taken at four-year universities, through EAP, or through an approved field study program. The director of undergraduate studies must approve each course. For more information about the approval and waiver process, see the Coursework Petition.

Anthropology courses from other universities that are approved by the Anthropology Department will count toward the elective requirement. Students **must** complete the Anthropology Senior Comprehensive requirement at UCSC—course petitions will not be accepted for this requirement.

Double Majors and Major/Minor Combinations Policy

Study Abroad

Anthropology is a very international discipline: the classes and coursework in this department draw upon studies of many different places and peoples. Most anthropologists work in foreign countries and all engage with scholarship from around the world. Anthropology students are strongly encouraged to make study abroad

part of their education and the department is currently developing a plan of study to enable students to conduct independent research abroad with which to write a senior thesis.

For more information on programs and planning, please see the UC Education Abroad Programs and the Conducting Thesis Research While Abroad pages.

Anthropology students who participate in EAP can petition up to two upper-division anthropology courses taken abroad to count toward the anthropology major or minor requirements. When approved, these courses count toward major/minor requirements as upper-division electives.

Note: The Anthropology Department at most will accept up to **two** courses from another university—this includes universities throughout the country and courses taken abroad.

The Anthropology Department **does not** pre-approve EAP courses to count toward the major/minor requirements. Students must petition for EAP courses to count toward requirements after returning from abroad by completing the Coursework Petition Form. It is very important that students save all of their EAP coursework as it may be needed for the course petition. Syllabi that are submitted for course petitions must include detailed information about the course—brief descriptions of courses and syllabi written in languages other than English will not be accepted. It is the student's responsibility to ask for a more detailed course description if the EAP instructor does not provide it.

Only anthropology courses taken through EAP are normally eligible to count toward anthropology major/minor requirements; however, if a university abroad does not have an anthropology department, other related courses may be considered.

Again, **save all EAP coursework**. It is the student's responsibility to retain all relevant course materials for EAP programs. It can often be difficult to contact instructors after an EAP program has ended.

Honors

The Anthropology Department awards honors in the major and highest honors in the major based on a ranked departmental grade point average (GPA) that is calculated using all upper-division courses taken in the major with the exception that only one independent-study course can be used in this calculation. For students who have taken multiple independent-study courses in the department, the independent-study course that has the highest grade is used for the calculation. Approximately 15 percent of the graduating class is considered for honors based on their ranked departmental GPA through the quarter before graduation. The criteria for awarding highest honors in the major are overall superlative performance in the major (top 5 percent of ranked departmental GPA) and general breadth of excellence across the subfields of anthropology. Receiving honors on the senior

comprehensive requirement is also considered as a factor in awarding highest honors, but is not always determinative.

Undergraduate Handbook

The Anthropology Undergraduate Handbook outlines information on department procedures and requirements, program planning, independent study, faculty interests, and campus resources for anthropology majors.

[Optional Catchall]

Requirements and Planners

Course Requirements

To graduate with an anthropology major, students must successfully complete the following courses:

Lower-Division Courses

ANTH 1	Introduction to Biological Anthropology	5
ANTH 2	Introduction to Cultural Anthropology	5
ANTH 3	Introduction to Archaeology	5

Upper-Division Courses

Ten upper-division courses

Five core requirements

- one course in anthropological theory
- one course in sociocultural anthropology
- one course in regional specialization
- one course in archaeology
- one course in biological, medical or environmental anthropology

Four anthropology electives (any additional upper-division anthropology courses)

Two-credit courses do not count toward the 10 upper-division courses required for the major. Only one 5-credit individual studies course (ANTH 197, ANTH 198, or ANTH 199) may be counted toward the 10 required upper-division courses. Theory courses can only be counted toward the theory requirement or an upper-division elective. See the section on Transfer Credit Toward Major/Minor Requirements for information on receiving credit for upper-division coursework taken at other institutions to be applied toward electives.

Students who are given permission to take a graduate seminar in anthropology may use the course to satisfy an upper division elective.

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division disciplinary communication (DC) requirement.

Anthropology's DC requirement aims especially at cultivating high-level skills in critical and ethnographic writing.

To satisfy the DC requirement students must complete a senior seminar series course or complete an independent senior thesis following the guidelines below.

Senior Seminar

Either a course in the ANTH 194 series or a course in the ANTH 196 series.

Senior Thesis

Either these courses		
ANTH 195A	Senior Thesis Seminar	5
ANTH 195B	Senior Thesis Research	3
ANTH 195C	Senior Thesis Capstone	3
or this course		
ANTH 195S	Senior Thesis	5

Comprehensive Requirement

Students can fulfill the senior comprehensive requirement in anthropology either by passing a senior seminar (ANTH 194/ANTH 196-series course) or by writing an acceptable independent senior thesis (ANTH 195S or ANTH 195A, ANTH 195B and ANTH 195C)

Senior seminars are small, writing-intensive classes focusing on advanced topics in anthropology. The prerequisite for admission to a senior seminar is successful completion of courses ANTH 1, ANTH 2, and ANTH 3; senior seminars are restricted to senior anthropology majors.

Students considering an independent thesis must arrange for the sponsorship and support of a faculty member before beginning research. An independent senior thesis (not written within a senior seminar) should be based on original research and reflect the student's understanding of fundamental theories and issues in anthropology. The thesis should be comparable in content, style, and length (generally 25–30 pages) to a professional journal article in its subfield. Students who wish to complete the senior comprehensive requirement through an independent thesis will enroll in a section of ANTH 195S supervised by their thesis sponsor or ANTH 195A, ANTH 195B and ANTH 195C series.

The senior comprehensive requirement can be satisfied in one of two ways:

Senior Seminar

Either a course in the ANTH 194 series or a course in the ANTH 196 series.

Senior Thesis

Requires enrollment in one of the following options:

Either this course		
ANTH 195S	Senior Thesis	5

or these courses			
ANTH 195A	Senior Thesis Seminar	5	
ANTH 195B	Senior Thesis Research	3	
ANTH 195C	Senior Thesis Capstone	3	

Planners

The following are two sample academic plans: (1) a four-year plan for frosh students as preparation for the anthropology B.A. major and (2) a two-year plan for transfer students for the anthropology B. A. major. ANTH 1 and ANTH 3 satisfy the SI general education requirement, and ANTH 2 satisfies the CC general education requirement.

Four-Year Plan

Year	Fall	Winter	Spring
1st (frosh)	ANTH 1	ANTH 2	ANTH 3
2nd (soph)	Bio/Med/En	Sociocultural	Archaeology
3rd (junior)	Theory	Regional	Upper-division elective Upper-division elective
4th (senior)	Upper-division elective	Upper-division elective	Senior Seminar*

*Alternatives listed in the section Requirements of the B.A.

Students must complete all other GE requirements, some of which are satisfied by anthropology courses.

Two-Year Plan

Year	Fall	Winter	Spring
3rd (junior)	Theory	Regional	Archaeology
	Upper-division elective	Sociocultural	Bio/Med/En

4th (senior)	Upper-division elective	Upper-division elective	Senior Seminar*
	Upper-division elective		

*Alternatives listed in the section Requirements of the B.A.

It is assumed that a student has completed ANTH 1, ANTH 2, and ANTH 3 before transferring to UCSC.

ANTHROPOLOGY MINOR

The minor in anthropology has a total of 10 courses required: three lower-division and seven upper-division courses. There is no theory course or senior comprehensive requirement for the minor in anthropology.

Course Requirements

Lower-Division Courses

ANTH 1	Introduction to Biological Anthropology	5
ANTH 2	Introduction to Cultural Anthropology	5
ANTH 3	Introduction to Archaeology	5

For information on receiving credit for lower-division coursework taken at other institutions, see the section Transfer Credit Toward Major/Minor Requirements

Upper-Division Courses

- one course in regional specialization
- one course in sociocultural anthropology
- one course in archaeology
- one course in biological, medical, or environmental anthropology
- three anthropology courses from the Courses in Anthropology by Category (p. 558) (no independent study courses)

ANTHROPOLOGY PH.D.

Introduction

The anthropology doctoral program at UCSC consists of three tracks: cultural anthropology, anthropological archaeology, and biological anthropology.

Although applicants are accepted only for the doctor of philosophy (Ph.D.) program, students may obtain a master of arts (M.A.) degree after fulfilling specific requirements during the first two years.

The theme of emerging worlds—culture and power after progress—unites the research interests of faculty in the cultural anthropology graduate program.

Our concentration on “emerging worlds” and on the construction of anthropological knowledge is especially well suited for drawing together diverse scholars and specialists in challenging and enriching conversations. Rather than reproduce the boundaries among the traditional subfields of anthropology, we explore how recombination of these approaches can elucidate specific anthropological problems.

The Ph.D. program in anthropological archaeology focuses on the pre-colonial and early post-colonial history of Africa, Mesoamerica, the Caribbean, and western North America. It is distinctive in insisting that theories of power, production and exchange, human ecology, gender, ethnicity, and technological practice be explored through rigorous laboratory and field research methods.

The Ph.D. program in biological anthropology has a methodological emphasis in innovative approaches to human and non-human primate ecology and diversity founded on our expertise in genomics and isotope biochemistry, as well as a longstanding expertise in skeletal biology and its application in bioarchaeology and forensic anthropology.

Advancement to Candidacy

Anthropology Ph.D. students are expected to advance to candidacy by the end of their third year in the program in order to maintain satisfactory academic progress.

Course Requirements

Both the department and the university define the major requirements for each stage of study. The first year of the program is geared toward giving students a theoretical foundation so that they may begin to formulate ideas for a research project. All graduate students are expected to be in residence (on campus) during their first year in the program. At the end of the first year, students will submit a portfolio of substantive work to their first-year committee.

Cultural Track Requirements

Students are expected to pass a first-year review and have advanced to Ph.D. candidacy by the end of their third year. In order to advance to candidacy in cultural anthropology, students must complete:

Core Courses

Must be completed in fall/winter of the first year in the program.*

ANTH 200A	Cultural Graduate Core Course	5
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ANTH 200B	Cultural Graduate Core Course	5
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* ANTH 252, Survey of Cultural Anthropology, is recommended if the student comes from a non-anthropological background.

Ethnographic Writing Requirement

This requirement may be completed by passing Ethnographic Practice, (ANTH 208A) or, upon approval from the department, through an independent research project in which the student engages in research based on participant observation or other ethnographic methodology and in which the student adequately translates that research experience into a written text.

Three Additional Cultural Anthropology Graduate Seminars

Grant Writing (ANTH 228), Colloquia (ANTH 292), Independent Study (ANTH 297/ANTH 299), and tutorials do not count toward this requirement. Tutorials that are taught in conjunction with undergraduate courses do not count toward this requirement.

Note: Not all of these courses are offered each year.

ANTH 208C	Design Anthropology	5
ANTH 219	Religions, States, Secularities	5
ANTH 220	Cartographies of Culture	5
ANTH 224	Anthropology of Secularism	5
ANTH 225	The Anthropology of Things: Sign, Gift, Commodity, Tool	5
ANTH 229	Constructing Regions	5
ANTH 233	Politics of Nature	5
ANTH 234	Feminist Anthropology	5
ANTH 235	Language and Culture	5
ANTH 238	Advanced Topics in Cultural Anthropology	5
ANTH 241	Social Justice	5
ANTH 247	Critical Perspectives on Nutrition	5
ANTH 248	Shadowy Dealings: Anthropology of Finance, Money, and Law	5
ANTH 249	Ecological Discourses	5
ANTH 253	Advanced Cultural Theory	5
ANTH 254	Medicine and Culture	5
ANTH 255	Regulating Religion/Sex	5
ANTH 258	Experimental Cultures	5
ANTH 259	Race in Theory and Ethnography	5
ANTH 262	Documenting Cultures	5
SOCY 268B	Science and Justice Research Seminar	5
ANTH 269	Global History and the Longue Duree	5

Archaeology Track Requirements

Students are expected to pass a first-year review and have advanced to Ph.D. candidacy by the end of their third year. In order to advance to candidacy in archaeology, students must complete:

Two Core Theory Courses

Must be completed during first year in the program.

ANTH 270A	Archaeology Graduate Core Course: History of Archaeological Theory	5
ANTH 270B	Current Directions in Archaeological Theory	5

Two Research Methods/Laboratory Courses

Student may substitute courses in another department with advisor approval.

NOTE: Lecture and Lab combinations count as a single course

ANTH 202A	Skeletal Biology	5
ANTH 280	Advanced Ceramic Analysis	5
ANTH 280L	Advanced Ceramic Analysis Laboratory	2
ANTH 285	Osteology of Mammals, Birds, and Fish	5

Two Courses on the Archaeology of a Geographical, Temporal, or Topical Area

Student may substitute courses in another department with advisor approval.

ANTH 273	Origins of Farming	5
ANTH 274	Origins of Complex Societies	5
ANTH 275	Tutorial in African Archaeology	5
ANTH 276A	Advanced Topics in North American Archaeology	5
ANTH 276B	Mesoamerican Archaeology	5
ANTH 276G	Archaeology of Colonial Borderlands	5
ANTH 287	Advanced Topics in Archaeology	5

Two Additional Graduate Seminars

Students may substitute a graduate seminar in cultural or biological anthropology or in another department with advisor approval. Tutorials that are taught in conjunction with undergraduate courses do not count toward this requirement.

ANTH 225	The Anthropology of Things: Sign, Gift, Commodity, Tool	5
ANTH 279	Feminism and Gender in Archaeology	5
ANTH 282	Household Archaeology	5

One Course in Grant Writing or Research Design

ANTH 228	Grant Writing	5
ANTH 272	Advanced Archaeological Research	5

Quantitative Methods Requirement

Students in the Archaeology PhD track must demonstrate competency in statistical or computational analysis techniques appropriate to their specific dissertation research projects and professional goals. Plans for gaining and demonstrating this competency should be developed as part of the first year review for each student, in consultation with their advisor and first year committee and with the approval of the department. This competency must be demonstrated and approved by the department prior to taking the qualifying exam and advancing to candidacy.

Two Laboratory Apprenticeships

ANTH 298	Advanced Laboratory Apprenticeship	5
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Biological Anthropology Track Requirements

Students are expected to pass a first-year review and have advanced to Ph.D. candidacy by the end of their third year. In order to advance to candidacy in biological anthropology, students must complete:

Core Course

Must be completed in Fall/Winter of first year in program.

ANTH 295A	Scientific Method: Biological Anthropology	5
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Ecology and Evolutionary Theory Requirement

Students in the biological anthropology Ph.D. track must demonstrate competency in ecology and evolutionary theory appropriate to their specific dissertation research projects and professional goals. Plans for gaining and demonstrating this competency should be developed during the first quarter in the program, in consultation with their advisor. This competency must be demonstrated and approved by the department by the end of the first year.

One Advanced Anthropological Methods and Research Course

Students in the biological anthropology Ph.D. track must demonstrate competency in advanced methods in human skeletal biology, forensics and bioarchaeology, molecular analysis (genetics), or stable isotope analysis. Plans for gaining and demonstrating this competency should be developed during the first quarter in the program, in consultation with their advisor. This competency must be demonstrated and approved by the department by the end of the first year.

One Additional Advanced Methods and Research

Course

Must be completed by the end of the second year. Student may substitute courses in another department with advisor approval.

One Graduate Seminar in Archaeology or Cultural Anthropology

Tutorials that are taught in conjunction with undergraduate courses do not count toward this requirement.

Must be completed by the end of the second year.

Quantitative or Computational Requirement

Students in the biological anthropology Ph.D. track must demonstrate competency in statistical or computational analysis techniques appropriate to their specific dissertation research projects and professional goals. Plans for gaining and demonstrating this competency should be developed as part of the first-year review for each student, in consultation with their advisor and first-year committee and with the approval of the department. This competency must be demonstrated and approved by the department prior to taking the qualifying examination and advancing to candidacy.

Nine Quarters of Advanced Reading in Biological Anthropology

Students are expected to enroll in ANTH 294R, Advanced Readings in Biological Anthropology, every quarter prior to advancing to candidacy.

ANTH 294R	Advanced Readings in Biological Anthropology	5
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Two Laboratory Apprenticeships

Students are required to enroll in ANTH 298, Advanced Laboratory Apprenticeship, or equivalent in another department.

ANTH 298	Advanced Laboratory Apprenticeship	5
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Six Quarters of Methods in Biological Anthropology

Students are expected to enroll in ANTH 216, Methods in Biological Anthropology, in every quarter prior to advancing to candidacy starting their second year.

ANTH 216	Methods in Biological Anthropology	5
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Nine Quarters of Seminar Series

Students are required to attend at least 8 talks per quarter in the Anthropology Colloquia, Arch-BioAnth Lunch Series, EEB Seminar Series, or EPS Seminar Series.

Comprehensive Exam

This must be completed prior to the end of the second year. Students must demonstrate knowledge in Ecological and Evolutionary Theory, expertise in at least two

subfields of Biological Anthropology, and sufficient background in either Archaeology or Cultural Anthropology, especially Medical or Environmental Anthropology. The exam format is a written essay and a two-hour oral exam.

Students may satisfy both the oral and written requirement with a manuscript (worthy of submission to a professional journal) based on a research project undertaken in the second year with advisor approval. They have to be first author of this manuscript in order to satisfy the requirement.

Foreign Language Requirements

The foreign language requirement must be fulfilled before taking the qualifying examination. A qualifying examination cannot be scheduled until the requirement has been met.

It is the responsibility of each graduate student to work with their advisor to identify the language competencies necessary for fieldwork and scholarship and to initiate study toward meeting these needs. To meet the language requirement, competency in one language must be formally demonstrated. Each student's advisor will recommend how this requirement should be met, as well as what additional skills should be sought. Generally accepted ways of meeting the language requirement include:

- Passing a standardized test at a predetermined level
- Taking and passing a translation examination administered by a UCSC language instructor or an outside assessor approved by the advisor. If necessary (i.e. for uncommon languages), a translation examination may be administered by a UCSC faculty member who is not a language instructor
- Taking and passing a series of language courses at a specified advanced level at UCSC or elsewhere, again, to be determined in consultation with the advisor

In some cases, the language in which a relevant scholarly literature exists will be the logical language of examination. In other cases, the language in which fieldwork will be conducted will be the most logical language for examination.

In the case of non-native English speakers who plan to undertake research in their own native language, English can meet the foreign language requirement. In the case of English native speakers who plan to do research in their native language, the requirement should be met by another language relevant to the field research or scholarly resources.

In cases where a foreign language is not necessary for field research nor for scholarly work, and learning a foreign language would significantly delay progress to degree and/or conflict with time needed to learn other necessary technical skills, students may apply to the

department for an Exemption to Policy for the foreign language requirement.

Teaching Requirement

Biological Anthropology Track students must complete two quarters as a teaching assistant.

Pre-Qualifying Requirements

Biological Anthropology track students must present a seminar on proposed research.

Qualifying Examination

The qualifying examination consists of two parts: a written file and a three-hour oral examination with the Qualifying Examination (QE) Committee during which the student presents and discusses the file.

For cultural track students, the file includes:

1. A theoretically focused dissertation research prospectus (approximately 18-25 pages, double-spaced, actual length to be determined by QE committee).
2. Two field statements on two anthropological topics selected and developed in consultation with the QE committee. Field statements typically review fields of literature that have (a) an area/regional focus and (b) a thematic/theoretical focus (approximately 18-25 pages, double-spaced, each; actual length to be determined by QE committee).

For archaeology track students, the file includes:

1. A theoretically-focused dissertation research prospectus (approximately 18-25 pages, double-spaced, actual length to be determined by the QE Committee).
2. Three field statements reviewing literature of 18-25 pages each on (a) a geographic cultural area, (b) a set of research methods, and (c) a theoretical tradition or theme.

For biological anthropology track students, the file includes:

A theoretically-focused dissertation research prospectus (approximately 18-25 pages, double-spaced, actual length to be determined by the QE Committee).

Post-Qualifying Requirements

Residency Requirement

In accordance with Senate Regulation 686, the minimum residence requirement for the Ph.D. degree is six terms, three of which must be spent in residence at the University of California, Santa Cruz campus. Residence is established by the satisfactory completion of one course per term.

[Optional Catchall]

Dissertation

Dissertation

Ph.D. candidates must prepare and submit a dissertation that is based on original research and meets the requirements of their dissertation reading committee.

Dissertation Defense

Academic Progress

Good Academic Standing and Probation

A duly registered graduate student is considered to be in good standing so long as the student's department determines that he or she is making satisfactory progress toward a terminal degree. The department and the graduate dean review the academic progress of each continuing graduate student annually.

If the Anthropology Department deems a student's work unsatisfactory, he or she may be placed on probation. A student whose academic progress has been found unsatisfactory in two successive annual reviews will be subject to dismissal from the university.

Recommended probation for a student states:

1. Reason why (failed X class, etc.)
2. Steps that must be taken to restore satisfactory academic standing
3. The timeline for completion of the required work

The letter to the student will state that the failure to meet any one of the requirements may result in dismissal. No action for dismissal is taken until and unless the department recommends dismissal.

A student who has completed 12 or more quarters of full-time work in the same graduate program without advancing to candidacy for the Ph.D. is not considered to be making satisfactory progress. In such cases, the student will be recommended for dismissal or placed on probation until advancement is achieved. A student advanced to candidacy for more than nine quarters who has yet to complete his or her Ph.D. is not considered to be making satisfactory academic progress. Consult the Graduate Student Handbook for more information about academic progress, probation, dismissal, and the appeal process.

Applying for Graduation

The Application for the Doctor of Philosophy Degree form must be completed with all necessary signatures obtained and submitted to the Division of Graduate Studies. Application deadlines are posted in the Academic and Administrative Calendar.

Students may request an extension for submission of their dissertation until late June with approval of their advisor.

To request an extension, contact the Anthropology Graduate Program coordinator.

If the student does not complete all the requirements for the degree, including submission of the dissertation by the deadline date, a new application form must be filed for the quarter in which the student will complete the requirements.

[Optional Catchall]

ANTHROPOLOGY DESIGNATED EMPHASIS

Introduction

A designated emphasis (DE) denotes a broadening of training that comes from adding course work, training, and/or research work from an external department, degree-granting program, or cross-departmental grouping of faculty who together offer a designated emphasis.

Requirements

Committee Composition and Departmental Approvals

One member of the student's qualifying examination committee must be a faculty member of the anthropology department. In addition, one member of the anthropology department must serve on the student's doctoral thesis committee.

Course Requirements

The student must take four graduate courses in the Department of Anthropology. An independent study with a faculty member of the Anthropology Department may count as only one of the four courses. Grant Writing (ANTH 228) may not be counted toward these requirements. Tutorials that are taught in conjunction with undergraduate courses do not count toward these requirements.

Writing, Research and/or Teaching Requirements

At the time of the qualifying examination, the student must submit to the Anthropology Department a full statement, up to five pages, summarizing the pre-qualifying examination work done in anthropology (courses, papers, research projects, independent studies) and characterizing how that work and the dissertation to follow draw from and contribute to anthropological and ethnographic inquiry. The dissertation research will normally include a fieldwork component.

In the quarter prior to announcing candidacy for graduation, the student must contact the graduate program coordinator to review their progress and confirm that all course and committee requirements have been met for the designated emphasis. In the quarter in which the student announces candidacy for graduation, the faculty member from the anthropology department serving on the student's doctoral thesis committee will evaluate the

depth of engagement with anthropology displayed in the doctoral thesis and decide whether the thesis fulfills the requirement to contribute to anthropological and ethnographic inquiry.

Academic Progress

[Optional Catchall]

ANTHROPOLOGY COURSE LISTS

Anthropology Course Lists

Course Lists

Anthropological Theory Courses

Note: Each course may only be used to satisfy a single major requirement. Courses cannot be double-counted for requirements within the anthropology major. Students may not substitute coursework from another program or institution for core requirements.

ANTH 100	History and Theory of Biological Anthropology	5
ANTH 150	Communicating Anthropology	5
ANTH 152	Survey of Cultural Anthropological Theory	5
ANTH 170	History of Archaeological Theory	5

Sociocultural Anthropology Courses

Note: Each course may only be used to satisfy a single major requirement. Courses cannot be double-counted for requirements within the anthropology major. Students may not substitute coursework from another program or institution for core requirements. Not all of these courses are offered each year.

ANTH 119	Indigenous Visual Culture	5
ANTH 125	Magic, Science, and Religion	5
ANTH 126	Contraband: Shadow Economies and the Law	5
ANTH 129	Beyond Borders: Other Globalizations and Histories of Interconnection	5
ANTH 131	Gender in Cross-Cultural Context	5
ANTH 134	Medical Anthropology: An Introduction	5
ANTH 135A	Cities	5
ANTH 136	The Biology of Everyday Life	5
ANTH 137	Consuming Culture	5
ANTH 138	Political Anthropology	5
ANTH 139	Language and Culture	5
ANTH 140	The Body in Rain: Environmental and Medical Intersections	5
ANTH 142	Anthropology of Law	5

ANTH 143	Performance and Power	5
ANTH 144	Anthropology of Poverty and Welfare	5
ANTH 145X	Special Topics in Socio-Cultural Anthropology	5
ANTH 146	Anthropology and the Environment	5
ANTH 147	Anthropology and the Anthropocene	5
ANTH 148	Gender and Global Development	5
ANTH 149	Anthropology of Activism	5
ANTH 151	Workshop in Ethnography	5
ANTH 157	Modernity and Its Others	5
ANTH 158	Feminist Ethnographies	5
ANTH 159	Race and Anthropology	5
ANTH 160	Reproductive and Population Politics	5
ANTH 161	The Anthropology of Food	5
ANTH 161S	Anthropology of Food, Abroad	5
ANTH 163	Kinship	5

Regional Specialization Courses

Note: Each course may only be used to satisfy a single major requirement. Courses cannot be double-counted for requirements within the anthropology major. Students may not substitute coursework from another program or institution for core requirements. Not all of these courses are offered each year.

ANTH 130A	Anthropology of Africa.	5
ANTH 130C	Politics and Culture in China	5
ANTH 130E	Culture and Politics of Island Southeast Asia	5
ANTH 130F	Blackness In Motion: Anthology of the African Diasporas	5
ANTH 130H	Ethnography of Russia and Eastern Europe	5
ANTH 130I	Cultures of India	5
ANTH 130L	Ethnographies of Latin America	5
ANTH 130M	Inside Mexico	5
ANTH 130O	Native Feminisms, Gender, and Settler Colonialism	5
ANTH 130P	Ethnography of Southern Cone Chile and Argentina	5
ANTH 130S	Ethnography of Russia and Eastern Europe, Abroad	5
ANTH 130T	Religion and Politics in the Muslim World	5
ANTH 130U	Central America	5
ANTH 130V	Ethnography of Russia	5
ANTH 130W	Ethnography of Eastern Europe	5
ANTH 130X	Special Topics in Ethnography	5

ANTH 175	African Archaeology	5
ANTH 176A	North American Archaeology	5
ANTH 176B	Meso-American Archaeology	5
ANTH 176C	Archaeology of the American Southwest	5
ANTH 176D	Colonial Encounters in the Americas	5
ANTH 176E	Archaeology of the Pacific Northwest	5
ANTH 176F	California Archaeology	5

Archaeology Courses

Note: Each course may only be used to satisfy a single major requirement. Courses cannot be double-counted for requirements within the anthropology major. Students may not substitute coursework from another program or institution for core requirements. Not all of these courses are offered each year.

ANTH 171	Materials and Methods in Historical Archaeology	5
ANTH 172	Archaeological Research Design	5
ANTH 173	Origins of Farming	5
ANTH 174	Origins of Complex Societies	5
ANTH 175	African Archaeology	5
ANTH 176A	North American Archaeology	5
ANTH 176B	Meso-American Archaeology	5
ANTH 176C	Archaeology of the American Southwest	5
ANTH 176D	Colonial Encounters in the Americas	5
ANTH 176E	Archaeology of the Pacific Northwest	5
ANTH 176F	California Archaeology	5
ANTH 177	Environmental Archaeology	5
ANTH 178	Historical Archaeology: A Global Perspective	5
HIS 158C	Slavery in the Atlantic World: Historical and Archaeological Perspectives	5
ANTH 180	Ceramic Analysis in Archaeology	5
ANTH 180L	Ceramic Analysis Laboratory	2
ANTH 181X	Special Topics in Archaeology	5
ANTH 182A	Lithic Technology	5
ANTH 184	Zooarchaeology	5
ANTH 185	Osteology of Mammals, Birds, and Fish	5
ANTH 187	Cultural Heritage in Colonial Contexts	5

ANTH 187B	Cultural Resource Management	5
ANTH 189	Archaeology Field Methods	5

or 6 credits of Practicum in Archaeology (ANTH 188A/ANTH 188B/ ANTH 188C)

ANTH 188A	Practicum in Archaeology A	2
ANTH 188B	Practicum in Archaeology B	2
ANTH 188C	Practicum in Archaeology C	2

Biological/Medical/Environmental Anthropology Courses

Note: Each course may only be used to satisfy a single major requirement. Courses cannot be double-counted for requirements within the anthropology major. Students may not substitute coursework from another program or institution for core requirements. Not all of these courses are offered each year.

Biological Anthropology

Note: Not all of these courses are offered each year.

ANTH 100	History and Theory of Biological Anthropology	5
ANTH 101	Human Evolution	5
ANTH 104	Human Variation and Adaptation	5
ANTH 105	Human Paleopathology	5
ANTH 106	Primate Behavior and Ecology	5
ANTH 111	Human Ecology	5
ANTH 190X	Special topics in Biological Anthropology	5

Medical Anthropology

Note: Not all of these courses are offered each year.

ANTH 134	Medical Anthropology: An Introduction	5
ANTH 136	The Biology of Everyday Life	5
ANTH 140	The Body in Rain: Environmental and Medical Intersections	5

Environmental Anthropology

Note: Not all of these courses are offered each year.

ANTH 140	The Body in Rain: Environmental and Medical Intersections	5
ANTH 146	Anthropology and the Environment	5
ANTH 147	Anthropology and the Anthropocene	5
ANTH 177	Environmental Archaeology	5

Anthropology At-Large Courses

Note: Not all of these courses are offered each year.

Anthropology At-Large courses may be used as electives for completing upper-division course requirements. These courses do not count as anthropological theory, sociocultural anthropology, regional specialization, or biological anthropology and archaeology courses.

ANTH 110A	Public Life and Contemporary Issues	5
ANTH 110B	From Indiana Jones to Stonehenge: Archaeology as Popular Culture	5
ANTH 110C	California Pasts	5
ANTH 110D	Tourism Imaginaries and Encounters	5
ANTH 110E	Anthropology of Global Environmental Change	5
ANTH 110F	Evolution of Human Diet	5
ANTH 110G	Westside Stories: Race, Place and the California Imaginary	5
ANTH 110H	Brazilian Amazon Cultures and Environments	5
ANTH 110J	Emerging Humanity	5
ANTH 110K	Culture Through Food	5
ANTH 110L	The Human Ocean	5
ANTH 110O	Postcolonial Britain and France	5
ANTH 110P	India and Indian Diaspora through Film	5
ANTH 110Q	Queer Sexuality in Black Popular Culture	5
ANTH 110S	Evolution of Democracy	5
ANTH 110T	Motherhood in American Culture	5
ANTH 110V	American Capitalism	5
ANTH 110W	Land and Waterscapes	5

Laboratory Methods Courses

Note: Not all of these courses are offered each year.

These courses are designed for students interested in pursuing graduate research or careers that require specialized training in laboratory methods.

Biological Anthropology Laboratory Methods

Note: Not all of these courses are offered each year.

The biological anthropology laboratory methods courses may be used to satisfy upper-division electives. These courses do not count toward the anthropological theory, sociocultural anthropology, regional specialization, or

biological/medical/environmental anthropology core requirements.

ANTH 102A	Human Skeletal Biology	5
ANTH 103	Forensic Anthropology	5
ANTH 103I	Forensic Anthropology	4
ANTH 107A	Methods and Research in Biological Anthropology: Genetics	5
ANTH 107B	Methods and Research in Biological Anthropology: Stable Isotopes	5
ANTH 107C	Methods and Research in Biological Anthropology: Chimpanzee Behavior and Culture	5
ANTH 107D	Methods and Research in Biological Anthropology–Computational Population Genetics	5

Archaeology Laboratory Methods

Note: Not all of these courses are offered each year.

Archaeology laboratory methods courses may be used to satisfy the archaeology core requirement or upper-division electives.

ANTH 171	Materials and Methods in Historical Archaeology	5
ANTH 180	Ceramic Analysis in Archaeology	5
ANTH 180L	Ceramic Analysis Laboratory	2
ANTH 182A	Lithic Technology	5
ANTH 184	Zooarchaeology	5
ANTH 184L	Zooarchaeology Laboratory	2
ANTH 185	Osteology of Mammals, Birds, and Fish	5

Senior Seminars

Note: Not all of these courses are offered each year.

ANTH 194A	Anthropology of Dead Persons	5
ANTH 194B	Chimpanzees: Biology, Behavior, and Evolution	5
ANTH 194C	Feminist Anthropology	5
ANTH 194F	Memory	5
ANTH 194H	Paleoanthropology	5
ANTH 194I	Consumption and Consumerism	5
ANTH 194K	Reading Ethnographies	5
ANTH 194L	Archaeology of the African Diaspora	5
ANTH 194M	Medical Anthropology	5

ANTH 194N	Comparison of Cultures	5
ANTH 194O	Masculinities	5
ANTH 194S	Hearing Culture: The Anthropology of Sound	5
ANTH 194T	Poverty and Inequality	5
ANTH 194U	Environmental Anthropology: Nature, Culture, Politics	5
ANTH 194V	Who Owns the Past? Ethical and Political Dimensions of Contemporary Archaeology	5
ANTH 194X	Women in Politics: A Third World Perspective	5
ANTH 194Z	Emerging Worlds	5
ANTH 196D	Food and Medicine	5
ANTH 196F	The Anthropology of Things: Gift, Sign, Commodity, Tool	5
ANTH 196G	Queer Worlds: Sexuality, Intimacy and Power in Contemporary Ethnography	5
ANTH 196H	Global History and the Longue Duree	5
ANTH 196J	Imagining America	5
ANTH 196K	Settler Colonialism	5
ANTH 196L	Archaeology of the American Southwest	5
ANTH 196M	Modernity and its Others	5
ANTH 196N	The Body, Narrative, and Creative Practice	5
ANTH 196O	Gender and Politics	5
ANTH 196P	Disability and Difference	5
ANTH 196Q	Property	5
ANTH 196R	Design Anthropology	5
ANTH 196T	Archaeology of Technology	5
ANTH 194Y	Archaeologies of Space and Landscape	5
ANTH 196U	Historical Anthropology	5
ANTH 196V	Radical Craft	5
ANTH 196W	Anthropology of Weather and Exposure	5

Community Studies

213 Oakes Academic Building
(831) 459-2371
<https://communitystudies.ucsc.edu/>

PROGRAMS OFFERED

Community Studies B.A. (p. 562)

Founded in 1969, community studies is the oldest interdisciplinary academic program at UCSC. The hallmarks of community studies are its focus on social justice and its distinctive pedagogy integrating classroom learning and extended field study. Community studies was a national pioneer in experiential education and its curricular model has been emulated widely. Community studies also was a pioneer in addressing principles of social justice, specifically inequities arising from race, class and gender dynamics in society at large, and in critically assessing strategies for achieving social change.

Community studies alumni have pursued a wide variety of professional careers in health care, K-12 education, public policy, social work, urban planning, higher education, and law. According to a 2005 alumni survey, almost 100 alumni have founded non-profit social justice organizations and many more have served on non-profit boards and/or in executive director positions. The phrase “we are everywhere” is an apt description of the contribution community studies alumni have made to society over the past half century.

COMMUNITY STUDIES B.A.

Information and Policies

Introduction

Founded in 1969, community studies is the oldest interdisciplinary academic program at UC Santa Cruz. The hallmarks of community studies are its focus on social justice and its distinctive pedagogy integrating classroom learning and extended field study. Community studies was a national pioneer in experiential education and its curricular model has been emulated widely. Community studies also was a pioneer in addressing principles of social justice, specifically inequities arising from race, class and gender dynamics in society at large, and in critically assessing strategies for achieving social change.

The undergraduate major offers highly motivated and focused students the opportunity to pursue a rigorous course of study combining on- and off-campus learning. On campus, students complete a core curriculum focused on strategies for social justice movements, nonprofit sector advocacy, public policy making, and social enterprise. The core curriculum works in tandem with topical coursework that develops knowledge in domains of social science scholarship related to student field studies, specifically around health justice and economic justice. Off campus, students commit to spending six months participating in the work of an organization to contribute to its mission and develop a critical analysis of

the wider field. Students work independently but with active guidance from both campus faculty and an on-site supervisor from the field study organization.

The undergraduate core curriculum begins with the development of skills in social analysis and field observation/participation while deepening students’ knowledge of specific histories and theoretical perspectives essential to the study of communities and social transformation. Next, through the six-month full-time field study, students engage with specific communities through immersion and participation in an organization with a focused social justice mission. This intensive and extended field study experience is a distinguishing feature of the community studies major. Finally, students return to campus to analyze their field study experience and its relation to their ongoing classroom-based learning. The major culminates with a senior capstone integrating academic coursework, field study analysis, and original writing.

With the guidance of faculty and staff advisors, community studies students choose field placements related to the program’s areas of focus in health justice and economic justice. In the past, placements have been arranged with community health clinics, women’s and feminist organizations, immigrant-rights centers, media advocacy organizations, homeless resource and support groups, sustainable development projects, queer and transgender organizations, neighborhood or workers’ collectives, civil rights groups, community food security programs, legal clinics, community-based cultural organizations, programs for seniors, tenant or labor unions, tenant organizing projects, HIV/AIDS advocacy groups, housing rights advocates, harm-reduction programs, government agencies and the offices of elected officials, and still other organizations committed to and working for social justice. As political, economic, cultural and technological landscapes shift, so do the needs and opportunities for social justice organizing. It is a dynamic world and throughout its history community studies has remained remarkably attuned and responsive to innovative field study opportunities.

Academic Advising for the Program

213 Oakes Academic Building
(831) 459-2371

To receive advising for the community studies major, students should schedule an appointment via slug success, email or call the program adviser. Full contact information is available on the program webpage. Our office is located on the second floor of the Oakes Academic Building in room 213. The office telephone number is 831-459-2371. Students are encouraged to meet with the program advisor as early as possible to develop an academic plan and take full advantage of all of the opportunities associated with early planning.

Transfer students should also consult the Transfer Information and Policy section.

Getting Started in the Major

Students interested in pursuing the community studies major should communicate with the program advisor to learn about the program's distinctive curriculum and requirements. Completing lower-division general education courses that build an understanding of and engagement with social justice issues is a great way to satisfy university requirements while building a solid foundation for the upper-division coursework required in the community studies major. Completion of the writing requirements before taking the first upper-division topical is strongly encouraged.

Transfer students should consult the Transfer Information and Policy section for specific recommendations to prepare for the major.

Program Learning Outcomes

Community studies identifies eight Program Learning Outcomes (PLOs) that together capture exciting cross currents within the major. The PLOs combine classroom and experiential learning related to the social justice domains of health and economic inequality. They also enumerate expectations for student achievement in social science research and writing and communication skills within a diverse society.

Critical Thinking

Students earning a B.A. in community studies will be able to:

1. demonstrate deep knowledge of the history, causes, and contemporary manifestations of specific social justice issues related to health and economic inequality;
2. deconstruct institutional power residing in private enterprise, government, the media, and/or the non-profit sector;
3. analyze how communities attempt to overcome problems associated with inequality, cultural stigma, prejudice, and discrimination;
4. articulate research questions, methods, and findings appropriate to social science inquiry; and
5. demonstrate analytical writing ability that effectively integrates theoretical and experiential knowledge about social justice.

Community Engagement

Students earning a B.A. in community studies will be able to:

1. identify, analyze, and help to construct strategies for social change through participation in the social justice work of an organization;
2. exhibit ethnographic observation skills by maintaining a regular record of detailed field notes;

3. demonstrate effective communication with the diverse constituencies involved in social justice work.

Major Qualification Policy and Declaration Process

Major Qualification

Students qualify to declare the community studies major by satisfactorily completing CMMU 10, Introduction to Community Activism, and at least one upper-division topical course from the approved list of courses. Satisfactory completion is defined by a grade of C or better in both major qualifying courses. Major qualification courses must be taken for a letter grade. Students must declare prior to enrolling in CMMU 102, Preparation for Field Study.

Students can file a petition to declare the major even before they have completed major qualification courses, if they are approaching their campus declaration deadline (i.e., in their sixth quarter, if admitted as frosh).

Transfer students should also consult the Transfer and Information Policy Section.

Appeal Process

Students who are informed that they are not eligible to declare the major may appeal this decision by submitting a letter addressed to the community studies program director within 15 days from the date of notification. Appeal letters should be submitted via email to the undergraduate advisor for the Community Studies Program. Within 15 days of receipt of the appeal, the program will notify the student and college of the decision.

How to Declare a Major

As part of the declaration process, students meet with the program director and/or staff advisor to review their academic plan for the major, including discussion of field study possibilities and appropriate courses to meet topical requirements. Students must submit their approved academic plan and declaration petition to the community studies staff adviser. Changes to the student's academic plan must be approved by the program director.

Transfer Information and Policy

Transfer Admission Screening Policy

Prospective students are encouraged to complete the Intersegmental General Education Transfer Curriculum (IGETC) or to complete all UC Santa Cruz general education requirements before matriculation. The Community Studies program can easily accommodate students who transfer to UCSC for the fall quarter.

Transfer students who plan to major in community studies will also find it useful to obtain a background in

politics, sociology, psychology, anthropology, or community action and service. Prior to their first quarter at UC Santa Cruz, transfer students should prepare a program of study and once on campus meet with the community studies student advisor in the program office to discuss the focus of their academic plan and field study plans.

Getting Started at UCSC as a Transfer Student

Transfer students are strongly encouraged to participate in the campus orientation program and connect with the community studies program adviser to develop an academic plan prior to their fall course enrollment.

Transfer students qualify to declare the community studies major by satisfactorily completing CMMU 10, Introduction to Community Activism, and one upper-division topical course from the approved list of course. Both of these courses should be completed during the fall quarter. Satisfactory completion is defined by a grade of C or better in both major qualifying courses. Major qualification courses must be taken for a letter grade.

As part of the declaration process, transfer students meet with the program director and/or staff advisor to review their academic plan for the major, including discussion of field study possibilities and appropriate courses to meet topical requirements. Students must submit their approved academic plan and declaration petition to the community studies staff adviser. Changes to the student's academic plan must be approved by the program director.

Letter Grade Policy

Satisfactory completion of all major course requirements is defined by a grade of C or higher. All courses for the major must be taken for a letter grade.

[Optional Catchall]

Course Substitution Policy

Double Majors and Major/Minor Combinations Policy

Study Abroad

Participation in EAP and other off-campus programs is strongly encouraged but requires advanced planning. Students considering EAP should schedule a meeting with the community studies advisor to determine the best quarter(s) for participation in such programs.

Honors

Honors in the community studies major are awarded to graduating seniors whose performance, including coursework, field study, and the senior capstone, is judged by a faculty committee to have achieved excellence. Highest honors in the major are reserved for students with consistently outstanding academic performance.

[Optional Catchall]

Requirements and Planners

Course Requirements

Satisfactory completion of all major course requirements is defined by a grade of C or higher. All courses in the major must be taken for a letter grade.

Lower-Division Courses

Complete CMMU 10 as early as possible, the course is only offered in the fall quarter and is one of two required courses to declare the major.

CMMU 10	Introduction to Community Activism	5
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Upper-Division Courses

Community Studies core curriculum courses are only offered during specific quarters and therefore it is very important to develop an academic plan as early as possible that takes this into account. Below are the required core courses and quarters they are offered:

CMMU 10 fall quarter (lower-division course)

CMMU 101 winter quarter

CMMU 102 spring quarter

CMMU 105A, CMMU 105B, CMMU 105C summer and fall quarters (30 credits total)

CMMU 107 winter quarter

In addition to the core curriculum, students must successfully complete three topical courses to develop expertise in health justice and/or economic justice. Students are required to take all three topical courses prior to their field study (CMMU 105 Full-time field study- 15 credits per quarter, completed in the summer and fall)

CMMU 101	Communities, Social Movements, and the Third Sector	5
CMMU 102	Preparation for Field Studies	5
CMMU 105A	Field Study	5
CMMU 105B	Field Study	5
CMMU 105C	Field Study	5
CMMU 107	Analysis of Field Materials	5

Topical Courses

Students must complete three upper-division courses on topics related to health justice and economic justice from available approved courses listed below. The program director also may approve other courses as appropriate. Topical courses are an essential component of the community studies major because they define the focus of

students' overall academic plan and their work on full-time field study. The topical courses also permit students to work across academic disciplines by learning from community studies affiliate faculty. Note that not all topical courses are offered every academic year. Check the program website for current academic year offerings.

Community Studies

CMMU 132	American Cities and Social Change	5
CMMU 133	Making California: Landscapes, People, Politics, Economy	5
CMMU 134	No Place Like Home	5
CMMU 141	Political Justice in Theory and Practice	5
CMMU 143	Wal-Mart Nation	5
CMMU 145	Global Capitalism: a History of the Present	5
CMMU 148	The Problem with Solutions	5
CMMU 149	Political Economy of Food and Agriculture	5
CMMU 156	Politics of Food and Health	5
CMMU 157	Ageism and Activism	5
CMMU 160	Public Health	5
CMMU 161	Gender Health and Justice	5
CMMU 162	Community Gardens and Social Change	5
CMMU 163	Health Care Inequalities	5
CMMU 164	Health Justice in Conflict	5
CMMU 165	Community Analysis for Global Health	5
CMMU 186	Food and Agriculture Social Movements	5
CMMU 186	Food and Agriculture Social Movements	5

Anthropology

ANTH 134	Medical Anthropology: An Introduction	5
ANTH 136	The Biology of Everyday Life	5
ANTH 153	Medicine and Colonialism	5
ANTH 194P	Space, Place, and Culture	5

Education

EDUC 135	Gender and Education	5
EDUC 173	Seminar in Critical Pedagogy	5
EDUC 181	Race, Class, and Culture in Education	5

Environmental Studies

ENVS 130B	Justice and Sustainability in Agriculture	5
ENVS 158	Political Ecology and Social Change	5

History of Art and Visual Culture

HAVC 141K	Activist Art Since 1960: Art, Technology, Activism	5
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HAVC 141O	Sex, Lies, and Surveillance: Contemporary Documentary Arts	5
HAVC 142	Contemporary Art and Ecology	5

History

HIS 123	Immigrants and Immigration in U.S. History	5
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Latin American and Latino Studies

LALS 175	Migration, Gender, and Health	5
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Oakes

OAKS 153	Community Mapping	5
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Politics

POLI 120C	State and Capitalism in American Political Development	5
POLI 122	Politics, Labor, and Markets	5
POLI 124	Economic Inequality in America	5
POLI 186	Global Health Politics	5
POLI 190L	Poverty Politics	5

Psychology

PSYC 147A	Psychology and Law	5
PSYC 147B	Psychology and Law	5
PSYC 149	Community Psychology: Transforming Communities	5
PSYC 153	The Psychology of Poverty and Social Class	5
PSYC 155	Social-Community Psychology in Practice	5
PSYC 159H	Community-Based Interventions	5

Sociology

SOCY 122	The Sociology of Law	5
SOCY 127	Drugs in Society	5
SOCY 131	Media, Marketing, and Culture	5
SOCY 176A	Work and Inequality	5
SOCY 177	Urban Sociology	5
SOCY 177E	Eco-Metropolis: Research Seminar in Urban and Environmental Studies	5
SOCY 177G	Global Cities	5

Electives

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division DC requirement. The community studies program's model of experiential pedagogy relies heavily

on writing instruction to develop students’ analytical, reflexive, and communication skills. As stated, although students in the major develop disciplinary writing skills throughout the core curriculum, they fulfill the DC requirement with:

CMMU 102	Preparation for Field Studies	5
CMMU 107	Analysis of Field Materials	5

Comprehensive Requirement

Senior Capstone Requirement

In addition to the full-time field study, another distinctive feature of the major is the emphasis placed on the capstone. Each student must fulfill this requirement, either through a senior essay, a senior thesis or a student-directed seminar. For a thesis or student-directed seminar, the student must work directly with a faculty advisor, usually for two quarters.

Senior Essay

All students complete a senior essay that incorporates field study observations and contextualizes their findings historically and theoretically. Most students pursue this capstone option. The minimum length is 25 pages, plus bibliography. The senior essay is completed entirely in:

CMMU 107	Analysis of Field Materials	5
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Senior Thesis

Outstanding students may choose to complete a senior thesis, which is comprised of field-study observations, historical and theoretical contextualizations of the field study, and deeper analysis of the social justice issues and histories at the heart of the field study. The thesis also involves post-field-study research; typical length is 40–50 pages, including bibliography. The senior essay completed during CMMU 107 will become the foundation for the thesis, whether as a template to be elaborated or as one or more chapters of the completed thesis. Students electing to write a senior thesis must have a faculty thesis advisor and under direction of the adviser, may enroll in the following courses for variable units in order to complete the thesis.

CMMU 195A	Senior Thesis	5
CMMU 195B	Senior Thesis	5
CMMU 195C	Senior Thesis	5

Student-Directed Seminar (SDS)

The SDS capstone option is reserved for exceptional students. Under the direction of a faculty adviser, the student develops and teaches a CMMU 42 course related to the student’s field study and academic coursework and submits a seminar completion report. Student-directed seminars need advance planning; a proposal for the SDS must be completed before beginning the field study.

Planners

Suggested Major Planning Table

	Fall	Winter	Spring	Summer
1st (frosh)	CMMU 10			
2nd (soph)	Topical course 1	Topical course 2		
3rd (junior)	Topical course 3	CMMU 101	CMMU 102	CMMU 105 (15 credits)
4th (senior)	CMMU 105 (15 credits)	CMMU 107	CMMU 195 (optional)	

If CMMU 10 is not taken in the fall of the first year, it can be taken one year later. Likewise, the topical courses need not be taken in the quarters indicated as long as they are completed before CMMU 105. Finally, students who start the major late can still complete the major as long as they have at least two years, as shown in the transfer planner (below). In addition to the specific courses shown in these planners, a student must complete courses satisfying the UC Santa Cruz general education and degree requirements.

Sample Transfer Planner

	Fall	Winter	Spring	Summer
3rd (junior)	CMMU 10	CMMU 101	CMMU 102	CMMU 105 (15 credits)
4th (senior)	Topical course 1	Topical course 2	Topical course 3	
	CMMU 105 (15 credit)	CMMU 107	CMMU 195 (optional)	

s)

Economics

401 Engineering 2
(831) 459-2743
<https://economics.ucsc.edu/>

PROGRAMS OFFERED

- Economics B.A. (p. 568)
- Business Management Economics B.A. (p. 573)
- Global Economics B.A. (p. 583)
- Economics/Mathematics Combined B.A. (p. 589)
- Economics Minor (p. 594)
- Applied Economics and Finance M.S. (p. 595)
- Economics Ph.D. (p. 597)

OTHER PROGRAMS OF INTEREST

Environmental studies/Economics B.A. (p. 654)

An understanding of economics is a vital component of a liberal arts education and a necessity for anyone interested in how the economic system actually works. Subject areas include business, environmental policy, economic development, immigration, educational reform, international competitiveness and trade, economic inequality, and transformations in the global economy.

The programs offered by the UC Santa Cruz Economics Department are designed to acquaint students with a broad range of economic issues and with the tools economists use.

UNDERGRADUATE PROGRAM

The economics curriculum begins at the introductory level; no specific high school preparation is required. All economics majors study a substantial core of economic theory and mathematical and statistical methods, and then choose among a wide variety of upper-division electives.

Economics majors may combine their upper-division elective choices in a variety of ways to achieve specialization in a number of possible areas, including environmental economics, public policy, political economy, international economics, economic development, and quantitative methods.

GRADUATE PROGRAM

The Department of Economics offers programs leading to the Ph.D. degree in economics and M.S. degree in applied economics and finance.

The Ph.D. program in economics provides students with training in modern microeconomics, macroeconomics, and econometrics, combined with specialized training in the fields of international finance and international trade and options to pursue specializations in economic development, monetary economics, applied microeconomics, experimental economics and other areas. The core emphasis of the program is on international trade and finance, and the program offers more intensive course work in these areas, as well as greater faculty depth in various aspects of international economics, than do traditional Ph.D. programs in economics that offer international economics as a single subfield. However, the department is also home to a large number of internationally recognized faculty whose work is outside of international and who regularly supervise Ph.D. students. Graduates of the program have conducted research on a wide variety of topics; examples include monetary economics, experimental economics, environmental economics, and economic growth and development as well as international economics.

Past graduates of the Ph.D. program have gone on to successful careers in the academic and research sectors with placements at a diverse range of companies and institutions, including Central Banks, Federal Reserve Board of Governors, Facebook, Microsoft, Amazon, UBER, Middlebury College, Occidental College, IMPAQ International, California State University, University of Wisconsin, Purdue University, Bank of International Settlements and many more.

The M.S. program in applied economics and finance is designed for students who wish to supplement their undergraduate work in economics with analytical graduate training that prepares them for careers in business, international and domestic banking, consulting firms, government, and nonprofit organizations. The program combines theory with meaningful applications that students are likely to face in their professional careers. The program is more practical than a typical M.A. program and provides more training in economics and statistics than most MBA programs.

Past graduates of this program have gone on to successful careers in the private and public sectors with placements at a diverse range of companies and institutions, including ADM Associates, Inc., Anderson Tax, SoFi, Cisco Systems, Seagate Technology, Google, Sony Computer Entertainment, Plantronics, Wells Fargo, Securities and Exchange Commission, all of the big four accounting firms, McKesson Corp., Pepsi Corp., Visa, Square Trade, the California Franchise Tax Board, Guardian News (UK), Blue Cross, the World Bank, Stanford University, and the Bank of Japan. Other graduates have gone on to earn Ph.D.s in economics.

ECONOMICS B.A.

Information and Policies

Introduction

Economics studies how individuals, firms, governments, and other organizations within our society make choices, and how these choices affect the society's use of its available resources. Economists study a wide range of questions such as: How do individuals make decisions in the face of uncertainty? What are the causes of the Great Recession of 2009? Why do Europeans work fewer hours than Americans? Why have health care and education costs risen so much? What are the consequences of government deficits? Why has the gap between rich and poor in many countries risen? Why have some poor countries grown faster than many rich countries in recent years?

Economics majors study a substantive core of theory and mathematical and statistical methods that aid in addressing these questions. This required core can be combined with electives that emphasize specialized areas such as international economics, finance, public policy, applied microeconomics, law and economics, economic development, quantitative methods, macroeconomics, game theory and behavioral economics. A focus on core theory as well as mathematical and quantitative tools provides a foundation for graduate studies in economics. Selecting a range of electives to sample the broad domain of economics offers an excellent background for students who plan to enter careers in the private sector, in public service, the non-profit sector or to attend law school or other professional schools.

Academic Advising for the Program

The Economics Department office is located at 401 Engineering 2. There are two staff undergraduate advisors, peer advisors (except summer), a field study coordinator, as well as a faculty director for each of the Economics Department's undergraduate programs. Our faculty, staff advisors and peer advisors play an important role in advising on all aspects of the major and assisting you to maximize your educational opportunities. Please check the department website for more information about drop-in hours.

Getting Started in the Major

The economics curriculum begins at the introductory level: no specific high school preparation is required. All majors study a substantial core of economic theory and statistical methods and they then choose among a wide variety of subfields.

Program Learning Outcomes

Program learning outcomes for economics, economics and mathematics, business management economics, and global economics majors:

Critical Thinking Skills: Students are expected to be able to apply economic analysis to everyday problems in real world situations, to understand current events and evaluate specific policy proposals, and to evaluate the role played by assumptions in arguments that reach different conclusions to a specific economic or policy problem.

Quantitative Reasoning Skills: Students are expected to understand how to use empirical evidence to evaluate the validity of an economic argument, use statistical methodology, interpret statistical results, and conduct appropriate statistical analysis of data.

Problem-Solving Skills: Students are expected to be able to solve problems that have clear solutions and to address problems that do not have clear answers and explain conditions under which these solutions may be correct.

Specialized Knowledge and Application of Skills: Students are expected to develop critical and quantitative thinking skills specific to business and accounting.

Communication Skills: Students are expected to be able to communicate effectively in written, oral, and graphical form about specific issues, and to formulate well-organized written arguments that state assumptions and hypotheses supported by evidence.

Major Qualification Policy and Declaration Process

Major Qualification

The Economics Department administers four undergraduate majors: economics, business management economics, global economics, and economics/mathematics.

(Qualifications for the environmental/economics combined major differ from above; see environmental studies for details.) Students should declare the major as soon as they have completed these requirements.

Students must complete three courses, with combined GPA of 2.8 or higher, to qualify for entry to the economics major:

ECON 1	Introductory Microeconomics: Resource Allocation and Market Structure	5
ECON 2	Introductory Macroeconomics: Aggregate Economic Activity	5

And one of the following calculus courses:

AM 11A	Mathematical Methods for Economists I	5
MATH 11A	Calculus with Applications	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5

Appeal Process

Students who have a grade point average (GPA) lower than 2.8 in ECON 1, ECON 2, and the calculus course are not eligible to declare an economics major. Students not eligible for the economics majors may appeal by submitting a letter to the Economics Department. The appeal letter must be filed no later than the first quarter of their junior year. Please check the "Appeals" area on the department web site for further information on declaring a major or appealing ineligibility and deadlines.

How to Declare a Major

Students can initiate the major declaration process by completing the Petition for Major/Minor Declaration and the Academic Planning forms and by supplying evidence of their grades in the three pre-major courses. Candidates must meet major qualifications listed above under "Major Qualification" prior to declaring the major.

Declaration sessions are mandatory for those seeking to declare the major/minor. If you cannot attend a workshop, you must meet with an economics peer advisor first before obtaining signatures from a staff advisor.

Workshop schedules and drop-in advising hours are available online, on our bulletin board outside the office and in the department office. All students are advised to bring verification of their grades, which can be printed off the student portal, to the declaration of major advising session. Students who do not bring in verification of their grades could have the approval of their petition for major declaration delayed by up to two working days.

Transfer Information and Policy

Transfer Admission Screening Policy

The following courses or their equivalents are required prior to transfer, by the end of the spring term for students planning to enter in the fall:

ECON 1, ECON 2 and first quarter of calculus (MATH 11A, MATH 19A or AM 11A/ECON 11A).

A minimum GPA of 2.8 must be obtained in the courses listed above. The admissions office screens transfer applicants for meeting major qualification criteria.

In addition, the following courses are recommended prior to transfer to ensure timely graduation:

completion of the calculus sequence (AM 11B or MATH 22/MATH 23A).

Prospective students are encouraged to prioritize required and recommended major preparation, and may additionally complete courses that articulate to UC Santa Cruz general education requirements as time allows.

Getting Started at UCSC as a Transfer Student

All transfer students must complete the three-course comprehensive requirement (ECON 100A, ECON 100B, ECON 113) and the disciplinary communication requirement (ECON 104 or ECON 197)

at UCSC. Economics majors must take at least three of their upper-division economics electives at UCSC. Courses taken for credit elsewhere may not be repeated for credit here.

Students who were admitted under a different proposed major and have advanced standing when they come to UCSC require permission from the department to change into the major. Admission to the major is not guaranteed.

Letter Grade Policy

All classes included for major qualification determination must be taken for a letter grade. If students have not taken a letter grade, they must appeal by submitting a letter to the Economics Department.

The Economics Department allows classes toward major requirements taken for the pass/no pass (P/NP) grade notification. We recommend no more than two courses in the major be taken P/NP. Overall no more than 25 percent of a student's UCSC classes can be taken P/NP.

[Optional Catchall]

Course Substitution Policy

For courses not already articulated through assist.org, students must present their transfer credit summary (available on the student portal) and course syllabi or descriptions to an Economics Department advisor. The department approves courses applicable for economics prerequisites and major requirements. The course substitution form can be found on the department website under "Forms for students".

Double Majors and Major/Minor Combinations Policy

Study Abroad

UC Education Abroad Program (UCEAP) is the University of California's official study abroad program and a global leader in international education for more than 50 years. All the benefits of home—UC credit, grades, and financial aid—travel with you. Approximately 600 UC Santa Cruz students study abroad on UCEAP every year.

Students can petition UCEAP courses to count toward their major or minor requirements. In addition, there are scholarships available and financial aid can be applied to UCEAP programs. UCEAP provides opportunities in:

- 46 countries around the world
- 420 summer quarter, semester or year-long programs
- Internships, volunteer work, and research programs

Economics at the Autonomous University of Barcelona -- Direct Exchange Program

Located in Spain, the Autonomous University of Barcelona (UAB) is an institution known for its excellent research and teaching. Unlike UCEAP, this direct

exchange program through the UC Santa Cruz Economics Department offers the opportunity for students to enroll in three courses that will fulfill economics major requirements and one course outside of economics. Students must take a total of four courses and will receive transfer credit for all courses. Along with enrolling in courses, students may enjoy the renowned architecture, food, and art. This program is open to students who are economics majors in junior or senior class standing and have a 3.0 cumulative GPA or above. Students must also be in good academic standing and 18 years of age or older at the time of departure to Barcelona. Economics courses at UAB may also be taken in Spanish if students have completed two years of university-level Spanish with a minimum GPA of 2.85 in those language courses.

Honors

The Economics Department considers for honors and highest honors students who have completed a major program with superior or exceptional work. Honors decisions are made by the department's honors and scholarship committee.

At the end of each quarter, faculty teaching the upper-division core courses submit to the department a list of students in their respective classes whose performance is at the honors level. At the time of graduation, all students who received an honors designation in one or more of these courses are reviewed by the department's honor committee. The faculty committee looks for a record of excellence in courses offered towards the major, with a strong performance in the upper-division core (theory and econometrics—ECON 100A/ECON 100M, ECON 100B/ECON 100N, and ECON 113) being a necessary condition for honors. Although a GPA is not computed for the economics courses, in general highest honors are awarded to students who have received a grade of at least an "A" throughout their economics program. Honors are awarded to students who have no more than two courses with grades of less than an "A-." Students who have completed a portion of the major at another institution may be asked to submit a transcript for evaluation.

Students interested in being reviewed for honors may request that the department conduct a review, and such requests are always granted.

In general, honors have been awarded to between 10 and 15 percent of each year's graduating class.

[Optional Catchall]

Independent Study

Students are encouraged to petition for independent study on topics of special interest to them. ECON 199, Tutorial, may be used as only one of the upper-division courses required for the major or minor.

Field-Study Program

The Economics Department offers its majors the opportunity to integrate their academic knowledge with career-related work in areas connected to economics or

business. The field-study program places students in internships under the supervision of a faculty sponsor and a professional at the workplace. Students can select from a wide variety of field placements such as accounting firms, community non-profits, government agencies, brokerage firms, marketing agencies, banks, and businesses in Santa Cruz and beyond. Students apply for field-study a quarter in advance. Participation in the field-study program requires at least junior standing, completion of courses ECON 100A (or ECON 100M), ECON 100B (or ECON 100N), and ECON 113 as well as good academic standing. Students may earn a maximum of 10 academic credits and complete up to two quarters in a field placement. A 5-credit field study requires 12-14 hours per week spent working on internship duties (a 2-credit field study requires 5-6 hours per week spent on internship duties) and completion of an academic project supervised by a faculty sponsor. Time spent toward the academic requirements set by the faculty sponsor is not included in the 12-14 internship hours spent at the field placement.

Along with the training and supervision by a professional at the workplace, students receive guidance from a faculty sponsor who directs their academic project. Students earn credit through the completion of this project and the job supervisor's evaluation of performance. Economics field-study courses do not satisfy any upper-division requirements for the major and are available as Pass/No Pass only.

Interested students should make an appointment or stop by the Economics Department at 403C Engineering 2; or e-mail econintern@ucsc.edu.

Combined Majors

The Economics Department offers the following combined majors: economics/mathematics and environmental studies/economics. Requirements for these majors may be reviewed under their separate entries in this catalog.

Requirements and Planners

Course Requirements

ECON 1 and ECON 2, AM 11A/ECON 11A, AM 11B/ECON 11B, ECON 100A (or ECON 100M), ECON 100B (or ECON 100N), ECON 113, and STAT 7 and STAT 7L or equivalent courses are required for all economics majors and are prerequisites for most upper-division courses. Students are urged to complete these courses as soon as possible. Students who are committed to the major early in their academic career, should plan to complete at least ECON 1, ECON 2, AM 11A/ECON 11A, AM 11B/ECON 11B, STAT 7 and STAT 7L and preferably ECON 100A, ECON 100B, and ECON 113 by the end of their sophomore year. Students are also encouraged to choose the letter grade option when taking these courses.

Students who major in economics are required to take the following courses:

Lower-Division Courses**All of the following courses:**

ECON 1	Introductory Microeconomics: Resource Allocation and Market Structure	5
ECON 2	Introductory Macroeconomics: Aggregate Economic Activity	5

Plus one of the following mathematics content options:

Either these
courses

AM 11A	Mathematical Methods for Economists I	5
AM 11B	Mathematical Methods for Economists II	5

or these
courses

MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5
MATH 22	Introduction to Calculus of Several Variables	5

or these
courses

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 23A	Vector Calculus	5

or these
courses

MATH 11A	Calculus with Applications	5
AM 11B	Mathematical Methods for Economists II	5

or these
courses

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
AM 11B	Mathematical Methods for Economists II	5

Mathematics content:

MATH 11A, MATH 11B, MATH 23A may be taken to satisfy the mathematics content only by petition via the Mathematics Department.

Students who have completed AM 30 will be allowed to use it instead of MATH 22/MATH 23A by appeal to the Economics Department.

Plus the following statistics courses:

STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences AND	5
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STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2
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Any transfer credit for STAT 7 and STAT 7L will be evaluated on a case-by-case basis.

Upper-Division Courses**Choose one of the following courses:**

ECON 100A	Intermediate Microeconomics	5
ECON 100M	Intermediate Microeconomics, Math Intensive	5

Plus one of the following courses:

ECON 100B	Intermediate Macroeconomics	5
ECON 100N	Intermediate Macroeconomics, Math Intensive	5

Plus the following course:

ECON 113	Introduction to Econometrics	5
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Plus one of the following disciplinary communication (DC) courses:

ECON 104	Is There Truth in Numbers: The Role of Statistics in Economics	5
ECON 197	Economic Rhetoric: Using Economic Theory and Empirical Evidence in Arguing Policy	5

Plus five additional upper-division economics courses, three to five of which must be selected from the following economics courses:

NOTE: Lecture/lab combinations count as one course (i.e., ECON 114 and ECON 114L).

ECON 105	Topics in Macroeconomics	5
ECON 114	Advanced Quantitative Methods	5
ECON 114L	Advanced Quantitative Methods Lab	2
ECON 121	Economic Growth	5
ECON 125	Economic History of the U.S.	5
ECON 120	Development Economics	5
ECON 124	Machine Learning for Economists	5
ECON 126	Why Economies Succeed or Fail: Lessons from Western and Japanese History	5
ECON 128	Poverty and Public Policy	5
ECON 130	Money and Banking	5
ECON 140	International Trade	5
ECON 141	International Finance	5

Planners**Sample Frosh Planner**

	Fall	Winter	Spring
1st (frosh)	Course MAT H 3 or AM 3	Course ECON 1 AM 11A/ECON 11A	Course ECON 2 AM 11B/ECON 11B
2nd (soph)	ECON 100A	ECON 100B STAT 7 & STAT 7L	ECON 113
3rd (junior)	ECON elective	ECON elective Field Study (Internship) <i>optional</i>	ECON elective Field Study <i>optional</i>
4th (senior)	ECON elective	ECON 104 or ECON 197	ECON elective

The courses shown above satisfy the MF, PE, and SR and, if ECON 193 is completed, then the PR general education requirements. In addition to the specific courses shown in these planners, a student must complete courses satisfying the UCSC general education requirements.

Sample Transfer Planner

	Fall	Winter	Spring
3rd (junior)	AM 11B/ECON 11B ECON elective	ECON 100A	ECON 100B ECON elective STAT 7 & STAT 7L
4th (senior)	ECON 113	ECON elective	Field Study

ECON elective
ECON 104 or ECON 197 (DC)
Field Study (Internship) *optional*

This planner assumes that a student has completed the major preparation requirements (ECON 1, ECON 2 and at least first calculus course) before coming to UCSC. In addition to the specific courses shown in these planners, a student must complete courses satisfying the UCSC general education requirements.

BUSINESS MANAGEMENT ECONOMICS B.A.

Information and Policies

Introduction

The business management economics major provides students who are interested in careers in business or management with a foundation in economics and a selection of applied fields related to business management. This course of study prepares students for entrance into the business world or admission to graduate programs—either the master's program in applied economics and finance at UCSC or graduate programs in business and management at other universities.

The program provides a business and management education embedded within a broader economics and liberal arts context and is closely related to the economics and global economics majors and the technology and information management major. The department also offers a series of accounting courses that prepare students interested in certified public accountant (CPA) licensure. Students in the business management economics major have the option of adding an accounting concentration designation on their transcripts, provided they meet the curricular criteria. Electing to complete the accounting course sequence will prepare students for the Uniform Certified Public Accountants' Exam and the credits will count toward exam eligibility. It will assist students in documenting their concrete expertise in accounting and thus help them compete for entry-level accounting positions in industry and public accounting as well as secure internship opportunities. For the concentration the eight (8) required courses include: ECON 110: Managerial Cost Accounting and Control, ECON 111A: Intermediate Accounting I, ECON 111B: Intermediate Accounting II, ECON 111C: Intermediate Accounting III, ECON 112: Audit, ECON 116: Advanced Topics in Accounting and Ethics, ECON 117A: Tax Factors for Individuals, and ECON 117B: Tax Factors for Business. Students electing the accounting concentration may also reduce their computer literacy requirements by one course (from two to one).

This major has several important elements. First, it combines the strong analytic approach of economics with the technical aspects of management. Second, it recognizes that computing is intrinsic to business and is an essential skill for those who wish to enter this field. Students in this major gain knowledge about using computing as a tool of analysis for economic, statistical, and financial data. Third, the major offers field placements (arranged with the economics advisors) which provide an excellent way to apply students' academic knowledge of economics, business, and management to issues and problems in the real world; they provide marketable skills as well as important job contacts.

Students who are committed to the major early in their academic career should plan to complete ECON 1, ECON 2, ECON 10A, ECON 10B, AM 11A/ECON 11A, AM 11B/ECON 11B, STAT 7 and STAT 7L and preferably ECON 100A, ECON 100B, and ECON 113 no later than the end of their sophomore year.

Academic Advising for the Program

The Economics Department office is located at 401 Engineering 2. There are two staff undergraduate advisors, peer advisors (except summer), a field study coordinator, as well as a faculty director for each of the Economics Department's undergraduate programs. Our faculty, staff advisors and peer advisors play an important role in advising on all aspects of the major and assisting you to maximize your educational opportunities. Please check the department website for more information about drop-in hours.

Getting Started in the Major

The economics curriculum begins at the introductory level: no specific high school preparation is required. All majors study a substantial core of economic theory and statistical methods and they then choose among a wide variety of subfields.

Program Learning Outcomes

Program learning outcomes for economics, economics and mathematics, business management economics, and global economics majors:

Critical Thinking Skills: Students are expected to be able to apply economic analysis to everyday problems in real world situations, to understand current events and evaluate specific policy proposals, and to evaluate the role played by assumptions in arguments that reach different conclusions to a specific economic or policy problem.

Quantitative Reasoning Skills: Students are expected to understand how to use empirical evidence to evaluate the validity of an economic argument, use statistical methodology, interpret statistical results, and conduct appropriate statistical analysis of data.

Problem-Solving Skills: Students are expected to be able to solve problems that have clear solutions and to address

problems that do not have clear answers and explain conditions under which these solutions may be correct.

Specialized Knowledge and Application of Skills: Students are expected to develop critical and quantitative thinking skills specific to business and accounting.

Communication Skills: Students are expected to be able to communicate effectively in written, oral, and graphical form about specific issues, and to formulate well-organized written arguments that state assumptions and hypotheses supported by evidence.

Major Qualification Policy and Declaration Process

Major Qualification

The Economics Department administers four undergraduate majors: economics, business management economics, global economics, and economics/mathematics.

Students must complete three courses, with combined GPA of 2.8 or higher, to qualify for entry to the business management economics major:

ECON 1	Introductory Microeconomics: Resource Allocation and Market Structure	5
ECON 2	Introductory Macroeconomics: Aggregate Economic Activity	5

And one of the following calculus courses:

AM 11A	Mathematical Methods for Economists I	5
MATH 11A	Calculus with Applications	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5

ECON 11A is also offered as AM 11A.

Appeal Process

Students who have a GPA lower than 2.8 in ECON 1, ECON 2, and the calculus course are not eligible to declare an economics major. Students not eligible for the economics majors may appeal by submitting a letter to the Economics Department. The appeal letter must be filed no later than the first quarter of their junior year. Please check the "Appeals" area on the department web site for further information on declaring a major or appealing ineligibility and deadlines.

How to Declare a Major

Students can initiate the major declaration process by completing the Petition for Major/Minor Declaration and the Academic Planning forms and by supplying evidence of their grades in the three pre-major courses. Candidates must meet major qualifications listed above under "Major Qualification" prior to declaring the major.

Declaration sessions are mandatory for those seeking to declare the major/minor. If you cannot attend a workshop, you must meet with an economics peer advisor first before obtaining signatures from a staff advisor.

Workshop schedules and drop-in advising hours are available online, on our bulletin board outside the office, and in the department office. All students are advised to bring verification of their grades, which can be printed off the student portal, to the declaration of major advising session. Students who do not bring in verification of their grades could have the approval of their petition for major declaration delayed by up to two working days.

Transfer Information and Policy

Transfer Admission Screening Policy

The following courses or their equivalents are required prior to transfer, by the end of the spring term for students planning to enter in the fall: ECON 1, ECON 2 and first quarter of calculus (MATH 11A, MATH 19A OR AM 11A/ECON 11A).

A minimum GPA of 2.8 must be obtained in the courses listed above. The admissions office screens transfer applicants for meeting major qualification criteria.

In addition, the following courses are recommended prior to transfer to ensure timely graduation: completion of the calculus sequence (AM 11B or MATH 22/MATH 23A); lower-division accounting (ECON 10A and ECON 10B equivalents).

Prospective students are encouraged to prioritize required and recommended major preparation, and may additionally complete courses that articulate to UC Santa Cruz general education requirements as time allows.

Getting Started at UCSC as a Transfer Student

All transfer students must complete the three-course senior comprehensive requirement (ECON 100A, ECON 100B, ECON 113) and the DC requirement (ECON 104 or ECON 197) at UC Santa Cruz. Economics majors must take at least three of their upper-division economics electives at UCSC. Courses taken for credit elsewhere may not be repeated for credit here.

Students who were admitted under a different proposed major and have advanced standing when they come to UCSC require permission from the department to change into the major. Admission to the major is not guaranteed.

Letter Grade Policy

All classes included for major qualification determination must be taken for a letter grade. If students have not taken a letter grade, they must appeal by submitting a letter to the Economics Department.

The Economics Department allows classes toward major requirements taken for the Pass/No Pass (P/NP) grade notification. We recommend no more than two courses in the major be taken P/NP. Overall no more than 25 percent of a student's UCSC classes can be taken P/NP.

[Optional Catchall]

Course Substitution Policy

For courses not already articulated through assist.org, students must present their transfer credit summary (available on the student portal) and course syllabi or descriptions to an Economics Department advisor. The department approves courses applicable for economics prerequisites and major requirements. The course substitution form can be found on the department website under "Forms for students".

Double Majors and Major/Minor Combinations Policy

Study Abroad

UC Education Abroad Program (UCEAP) is the University of California's official study abroad program and a global leader in international education for over 50 years. All the benefits of home—UC credit, grades, and financial aid—travel with you. Approximately 600 UC Santa Cruz students study abroad on UCEAP every year.

Students can petition UCEAP courses to count toward their major or minor requirements. In addition, there are scholarships available and financial aid can be applied to UCEAP programs. UCEAP provides opportunities in:

- 46 countries around the world
- 420 summer quarter, semester or yearlong programs
- Internships, volunteer work, and research programs

Economics at the Autonomous University of Barcelona-- Direct Exchange Program
 Located in Spain, the Autonomous University of Barcelona (UAB) is an institution known for its excellent research and teaching. Unlike UCEAP, this direct exchange program through the UC Santa Cruz Economics Department offers the opportunity for students to enroll in three courses that will fulfill economics major requirements and one course outside of economics. Students must take a total of four courses and will receive transfer credit for all courses. Along with enrolling in courses, students may enjoy the renowned architecture, food, and art. This program is open to students who are economics majors in junior or senior class standing and have a 3.0 cumulative GPA or above. Students must also be in good academic standing and 18 years of age or older at the time of departure to Barcelona. Economics courses at UAB may also be taken in Spanish if students have completed two years of university-level Spanish with a minimum GPA of 2.85 in those language courses.

Honors

The Economics Department considers for honors and highest honors students who have completed a major program with superior or exceptional work. Honors decisions are made by the department's Honors and Scholarship Committee.

At the end of each quarter, faculty teaching the upper-division core courses submit to the department a list of students in their respective classes whose performance is at the honors level. At the time of graduation, all students who received an honors designation in one or more of these courses are reviewed by the department's honor committee. The faculty committee looks for a record of excellence in courses offered toward the major, with a strong performance in the upper-division core (theory and econometrics—ECON 100A/ECON 100M, ECON 100B/ECON 100N, and ECON 113) being a necessary condition for honors. Although a GPA is not computed for the economics courses, in general highest honors are awarded to students who have received a grade of at least an "A" throughout their economics program. Honors are awarded to students who have no more than two courses with grades of less than an "A-." Students who have completed a portion of the major at another institution may be asked to submit a transcript for evaluation.

Students interested in being reviewed for honors may request that the department conduct a review, and such requests are always granted.

In general, honors have been awarded to between 10 and 15 percent of each year's graduating class.

[Optional Catchall]

Independent Study

Students are encouraged to petition for independent study on topics of special interest to them. ECON 199, Tutorial, may be used as only one of the upper-division courses required for the major or minor.

Field-Study Program

The Economics Department offers its majors the opportunity to integrate their academic knowledge with career-related work in areas connected to economics or business. The field-study program places students in internships under the supervision of a faculty sponsor and a professional at the workplace. Students can select from a wide variety of field placements such as accounting firms, community non-profits, government agencies, brokerage firms, marketing agencies, banks, and businesses in Santa Cruz and beyond. Students apply for field-study a quarter in advance. Participation in the field-study program requires at least junior standing, completion of courses ECON 100A (or ECON 100M), ECON 100B (or ECON 100N), and ECON 113 as well as good academic standing. Students may earn a maximum of 10 academic credits and complete up to two quarters in a field placement. A 5-credit field study requires 12-14 hours per week spent working on internship duties (a 2-credit field study requires 5-6 hours per week spent on internship duties) and completion of an academic project supervised by a faculty sponsor. Time spent toward the academic requirements set by the faculty sponsor is not included in the 12-14 internship hours spent at the field placement.

Along with the training and supervision by a professional at the workplace, students receive guidance from a faculty sponsor who directs their academic project. Students earn credit through the completion of this project and the job supervisor's evaluation of performance. Economics field-study courses do not satisfy any upper-division requirements for the major and are available as Pass/No Pass only.

Interested students should make an appointment or stop by the Economics Department at 403C Engineering 2; or e-mail econintern@ucsc.edu.

Combined Majors

The Economics Department offers the following combined majors: economics/mathematics and environmental studies/economics. Requirements for these majors may be reviewed under their separate entries in this catalog.

General Business Management Economics Major

Course Requirements

ECON 1 and ECON 2, ECON 10A, ECON 10B, AM 11A/ECON 11A, AM 11B/ECON 11B, STAT 7 and STAT 7L, ECON 100A (or ECON 100M), ECON 100B (or ECON 100N), ECON 113 or equivalent courses are required for all business management economics majors and are prerequisites for most upper-division courses. Students are urged to complete these courses as soon as possible. Students who are committed to the major early in their academic career, should plan to complete at least ECON 1, ECON 2, AM 11A/ECON 11A, AM 11B/ECON 11B, STAT 7 and STAT 7L and preferably ECON 100A, ECON 100B, and ECON 113 by the end of their sophomore year. Students are also encouraged to choose the letter grade option when taking these courses.

Students who major in business management economics are required to take the following courses:

Lower-Division Courses

All of the following courses:

ECON 1	Introductory Microeconomics: Resource Allocation and Market Structure	5
ECON 2	Introductory Macroeconomics: Aggregate Economic Activity	5
ECON 10A	Economics of Accounting	5
ECON 10B	Economics of Accounting	5

Plus one of the following mathematics content options:

AM 11A	Mathematical Methods for Economists I	5
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AM 11B	Mathematical Methods for Economists II	5
or these courses		
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5
MATH 22	Introduction to Calculus of Several Variables	5
or these courses		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 23A	Vector Calculus	5
or these courses		
MATH 11A	Calculus with Applications	5
AM 11B	Mathematical Methods for Economists II	5
or these courses		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
AM 11B	Mathematical Methods for Economists II	5

MATH 11A, MATH 11B, MATH 23A may be taken to satisfy the mathematics content only by petition via the Mathematics Department.

Students who have completed AM 30 will be allowed to use it instead of MATH 22/MATH 23A by appeal to the Economics Department.

Plus the following statistics courses:

STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
AND		
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

Any transfer credit for STAT 7 and STAT 7L will be evaluated on a case-by-case basis.

Computer literacy requirement

Students must complete a minimum of two courses from the following list (with department approval, a student may substitute other computing courses):

Note: Lecture/lab combinations count as one course

Students with no prior programming experience are encouraged to take CSE 5J, CSE 10 or CSE 20.

(CSE 10 is not offered regularly.)

Computer Science and Engineering

CSE 5J	Introduction to Programming in Java	5
CSE 10	Introduction to Computer Science	5
CSE 12	Computer Systems and Assembly Language	5
CSE 13S	Computer Systems and C Programming	7
CSE 20	Beginning Programming in Python	5
CSE 30	Programming Abstractions: Python	7
CSE 50	Business Information Systems	5
CSE 58	Systems Analysis and Design	5
CSE 80N	Introduction to Networking and the Internet	5
ECE 13	Computer Systems and C Programming	7

Upper-Division Courses

Choose one of the following courses:

ECON 100A	Intermediate Microeconomics	5
ECON 100M	Intermediate Microeconomics, Math Intensive	5

Plus one of the following courses:

ECON 100B	Intermediate Macroeconomics	5
ECON 100N	Intermediate Macroeconomics, Math Intensive	5

Plus the following course:

ECON 113	Introduction to Econometrics	5
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Plus one of the following disciplinary communication (DC) courses:

ECON 104	Is There Truth in Numbers: The Role of Statistics in Economics	5
ECON 197	Economic Rhetoric: Using Economic Theory and Empirical Evidence in Arguing Policy	5

Upper-division electives

Students are required to take five additional courses: four in business management and one other economics elective.

Students must choose four business management courses from the following list; at least one of the four must be ECON 101, ECON 133, or ECON 135.

ECON 130, ECON 159, ECON 160A, ECON 160B: Students can use **only one** of these courses as either a

business management elective or an economics elective, but the course cannot be counted twice.	ECON	Advanced Quantitative	2
ECON 101 Managerial Economics	114L	Methods Lab	
ECON 110 Managerial Cost Accounting and Control	ECON 120	Development Economics	5
ECON 111A Intermediate Accounting I	ECON 121	Economic Growth	5
ECON 111B Intermediate Accounting II	ECON 125	Economic History of the U.S.	5
ECON 111C Intermediate Accounting III	ECON 126	Why Economies Succeed or Fail: Lessons from Western and Japanese History	5
ECON 112 Auditing and Attestation	ECON 128	Poverty and Public Policy	5
ECON 115 Introduction to Management Sciences	ECON 130	Money and Banking	5
ECON 117A Income Tax Factors for Individuals	ECON 140	International Trade	5
ECON 117B Tax Factors of Business and Investment	ECON 141	International Finance	5
ECON 119 Advanced Accounting	ECON 142	Advanced Topics in International Economics	5
ECON 124 Machine Learning for Economists	ECON 143	Policy Issues in the International Economy	5
ECON 130 Money and Banking	ECON 148	Latin American Economies	5
ECON 131 International Financial Markets	ECON 149	The Economies of East and Southeast Asia	5
ECON 133 Security Markets and Financial Institutions	ECON 150	Public Finance	5
ECON 135 Corporate Finance	ECON 156	Health Care and Medical Economics	5
ECON 136 Business Strategy	ECON 159	The Economics of Organizations	5
ECON 138 The Economics and Management of Technology and Innovation	ECON	Industrial Organization	5
ECON 139A The Economics of Electronic Commerce	160A		
ECON 139B E-Commerce Strategy	ECON	Government and Industry	5
ECON 159 The Economics of Organizations	160B		
ECON 160A Industrial Organization	ECON 165	Economics as an Experimental Science	5
ECON 160B Government and Industry	ECON	Game Theory and Applications I	5
ECON 161A Marketing	ECON	Game Theory and Applications II	5
ECON 161B Marketing Research	ECON 169	Economic Analysis of the Law	5
ECON 164 Economics and the Telecommunications Industry	ECON 170	Environmental Economics	5
ECON 188 Management in the Global Economy	ECON 171	Natural Resource Economics	5
ECON 194 Advanced Topics in Management	ECON 175	Energy Economics	5
	ECON 180	Labor Economics	5
	ECON 183	Women in the Economy	5
	ECON 190	Senior Proseminar	5

Courses ECON 191, ECON 192, ECON 193, ECON 193F may not be used to meet major requirements. Either course ECON 195 or ECON 199 may be used to fill one of the five elective upper-division major requirements.

Economics Elective (choose one)

ECON 105	Topics in Macroeconomics	5
ECON 114	Advanced Quantitative Methods	5

Field-study

One quarter of field study is strongly recommended. Placements and credit for course ECON 193 are arranged through the economics field-study coordinator. See above under field-study program description.

Electives

Disciplinary Communication (DC) Requirement

All undergraduate majors must satisfy the campus' disciplinary communication (DC) requirement. The DC requirement in economics is satisfied by completing one of the following courses:

ECON 104	Is There Truth in Numbers: The Role of Statistics in Economics	5
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ECON 197 Economic Rhetoric: Using Economic Theory and Empirical Evidence in Arguing Policy 5

Computer course
ECON 101, ECON 133 or ECON 135 (Business Management elective)
Field Study internship (optional)

Comprehensive Requirement

The comprehensive requirement is satisfied by passing the following intermediate core courses with grades of C or better here at UCSC:

Choose one of the following courses:

ECON 100A Intermediate Microeconomics 5
ECON 100M Intermediate Microeconomics, Math Intensive 5

Plus one of the following courses:

ECON 100B Intermediate Macroeconomics 5
ECON 100N Intermediate Macroeconomics, Math Intensive 5

Plus the following course:

ECON 113 Introduction to Econometrics 5

The courses shown above satisfy the MF, PE, and SR and, if ECON 193 is completed, then the PR general education requirements. In addition to the specific courses shown in these planners, a student must complete courses satisfying the UCSC general education requirements.

Sample Transfer Planner

Planners

Sample Frosh Planner

	Fall	Winter	Spring
1st (freshman)	MATH 3 or AM 3	ECON 1 AM 11A/ECON 11A	ECON 2 AM 11B/ECON 11B
2nd (sophomore)	ECON 100A ECON 10A	ECON 100B STAT 7 & STAT 7L	ECON 113 ECON 10B
3rd (junior)	Econ elective	Business Management elective Computer Course	Business Management elective
4th (senior)	Business Management elective	ECON 104 or ECON 197	Field Study (optional)

	Fall	Winter	Spring
3rd (junior)	AM 11B/ECON 11B ECON elective ECON 10A	ECON 100A Computer course ECON 10B	ECON 100B Business Management elective STAT 7 & STAT 7L
4th (senior)	ECON 113 Business Management elective	Business Management elective ECON 101, ECON 133 or ECON 135 (Business Management elective) ECON 104 or ECON 197	Field Study (optional) Computer Course

This planner assumes that a student has completed the major preparation requirements (ECON 1, ECON 2 and at least first calculus course) before coming to UCSC. In addition to the specific courses shown in these planners, a student must complete courses satisfying the UCSC general education requirements.

Business Management with Accounting Concentration

Only students in the business management economics major have the option of adding an accounting concentration designation on their transcripts, provided they meet the curricular criteria. Electing to complete the accounting course sequence will prepare students for the Uniform Certified Public Accountants' Exam and the credits will count toward exam eligibility. It will assist students in documenting their concrete expertise in accounting and thus help them compete for entry-level accounting positions in industry and public accounting as well as secure internship opportunities. For the concentration the eight (8) required courses include: ECON 110: Managerial Cost Accounting and Control, ECON 111A: Intermediate Accounting I, ECON 111B: Intermediate Accounting II, ECON 111C: Intermediate Accounting III, ECON 112: Audit, ECON 116: Advanced Topics in Accounting and Ethics, ECON 117A: Tax Factors for Individuals, and ECON 117B: Tax Factors for Business. Students electing the accounting concentration may also reduce their computer literacy requirements by one course (from two to one).

Course Requirements

ECON 1 and ECON 2, ECON 10A, ECON 10B, AM 11A/ECON 11A, AM 11B/ECON 11B, ECON 100A (or ECON 100M), ECON 100B (or ECON 100N), ECON 113, and STAT 7 & STAT 7L or equivalent courses are required for all business management economics majors and are prerequisites for most upper-division courses. Students are urged to complete these courses as soon as possible. Students who are committed to the major early in their academic career, should plan to complete at least ECON 1, ECON 2, AM 11A/ECON 11A, AM 11B/ECON 11B, and preferably ECON 100A, ECON 100B, and ECON 113 by the end of their sophomore year. Those students interested in the accounting concentration should also complete ECON 10A and ECON 10B by the end of their sophomore year. Students are also encouraged to choose the letter grade option when taking these courses.

Students who major in business management economics are required to take the following courses:

Lower-Division Courses

All of the following courses:

ECON 1	Introductory Microeconomics: Resource Allocation and Market Structure	5
ECON 2	Introductory Macroeconomics: Aggregate Economic Activity	5
ECON 10A	Economics of Accounting	5
ECON 10B	Economics of Accounting	5

Plus one of the following mathematics options:

Either these courses		
AM 11A	Mathematical Methods for Economists I	5
AM 11B	Mathematical Methods for Economists II	5
or these courses		
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5
MATH 22	Introduction to Calculus of Several Variables	5
or these courses		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 23A	Vector Calculus	5
or these courses		
MATH 11A	Calculus with Applications	5
AM 11B	Mathematical Methods for Economists II	5
or these courses		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
AM 11B	Mathematical Methods for Economists II	5

MATH 11A, MATH 11B, MATH 23A may be taken to satisfy the mathematics content only by petition via the Mathematics Department.

Plus the following statistics courses:

STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
AND		
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

Any transfer credit for STAT 7 and STAT 7L will be evaluated on a case-by-case basis.

Computer literacy requirement

Students pursuing the accounting concentration must complete one course from the following list (with department approval, a student may substitute other computing courses):

NOTE: Lecture/lab combinations count as one course

Students with no prior programming experience are encouraged to take CSE 5J, CSE 10 or CSE 20.

(CSE 10 is not offered regularly.)			ECON 116	Advanced Topics in	5
CSE 5J	Introduction to	5		Accounting and Ethics	
	Programming in Java		ECON	Income Tax Factors for	5
CSE 10	Introduction to Computer	5	117A	Individuals	
	Science		ECON 117B	Tax Factors of Business	5
CSE 12	Computer Systems and	5		and Investment	
	Assembly Language				
CSE 13S	Computer Systems and C	7	Plus one of the following courses:		
	Programming		ECON 101	Managerial Economics	5
CSE 20	Beginning Programming in	5	ECON 133	Security Markets and	5
	Python			Financial Institutions	
CSE 30	Programming Abstractions:	7	ECON 135	Corporate Finance	5
	Python				
CSE 50	Business Information	5	Economics Elective (choose one)		
	Systems		ECON 114 and ECON 114L count as one course		
CSE 58	Systems Analysis and	5	ECON 105	Topics in Macroeconomics	5
	Design		ECON 114	Advanced Quantitative	5
CSE 80N	Introduction to Networking	5		Methods	
	and the Internet		ECON	Advanced Quantitative	2
ECE 13	Computer Systems and C	7	114L	Methods Lab	
	Programming		ECON 120	Development Economics	5
			ECON 121	Economic Growth	5
			ECON 125	Economic History of the	5
				U.S	
			ECON 126	Why Economies Succeed or	5
				Fail: Lessons from Western	
				and Japanese History	
			ECON 128	Poverty and Public Policy	5
			ECON 130	Money and Banking	5
			ECON 140	International Trade	5
			ECON 141	International Finance	5
			ECON 141	International Finance	5
			ECON 142	Advanced Topics in	5
				International Economics	
			ECON 143	Policy Issues in the	5
				International Economy	
			ECON 148	Latin American Economics	5
			ECON 149	The Economies of East and	5
				Southeast Asia	
			ECON 150	Public Finance	5
			ECON 156	Health Care and Medical	5
				Economics	
			ECON 159	The Economics of	5
				Organizations	
				Industrial Organization	5
			ECON		
			160A	Government and Industry	5
			ECON		
			160B		
			ECON 165	Economics as an	5
				Experimental Science	
			ECON	Game Theory and	5
			166A	Applications I	
			ECON	Game Theory and	5
			166B	Applications II	
			ECON 169	Economic Analysis of the	5
				Law	
			ECON 170	Environmental Economics	5
			ECON 170	Environmental Economics	5
			ECON 171	Natural Resource	5
				Economics	
			ECON 175	Energy Economics	5
			ECON 180	Labor Economics	5

Upper-Division Courses

Choose one of the following courses:

ECON	Intermediate	5
100A	Microeconomics	
ECON	Intermediate	5
100M	Microeconomics, Math	
	Intensive	

Plus one of the following courses:

ECON	Intermediate	5
100B	Macroeconomics	
ECON	Intermediate	5
100N	Macroeconomics, Math	
	Intensive	

Plus the following course:

ECON 113	Introduction to	5
	Econometrics	

Required courses for the accounting concentration:

Students in the accounting concentration are required to take 10 additional courses: eight upper-division accounting electives, plus ECON 101 or ECON 133 or ECON 135 and one other economics elective.

Courses ECON 191, ECON 192, ECON 193, ECON 193F may not be used to meet major requirements. Either course ECON 195 or ECON 199 may be used to fill the upper-division economics elective.

ECON 110	Managerial Cost	5
	Accounting and Control	
ECON	Intermediate Accounting I	5
111A		
ECON 111B	Intermediate Accounting II	5
ECON 111C	Intermediate Accounting	5
	III	
ECON 112	Auditing and Attestation	5

ECON 183 Women in the Economy 5

Field Study

One quarter of field study is strongly recommended. Placements and credit for course ECON 193 are arranged through the economics field-study coordinator. See above under field-study program description. ECON 193 also fulfills the PR general education requirement.

Disciplinary Communication (DC) Requirement

All undergraduate majors must satisfy the campus' Disciplinary Communication (DC) requirement. The DC requirement in economics is satisfied by completing one of the following courses:

- ECON 104 Is There Truth in Numbers: The Role of Statistics in Economics 5
- ECON 197 Economic Rhetoric: Using Economic Theory and Empirical Evidence in Arguing Policy 5

Comprehensive Requirement

The comprehensive requirement is satisfied by passing the following intermediate core courses with grades of C or better here at UCSC:

- Either one of these courses
- ECON 100A Intermediate Microeconomics 5
- ECON 100M Intermediate Microeconomics, Math Intensive AND 5
- Either one of these courses
- ECON 100B Intermediate Macroeconomics 5
- ECON 100N Intermediate Macroeconomics, Math Intensive AND 5
- ECON 113 Introduction to Econometrics 5

Planners

Sample Frosh Planner

	Fall	Winter	Spring
1st (frosh)	MATH 3 or AM 3	ECON 1	ECON 2
	Writing course	AM 11A/ECO N 11A	AM 11B/ECON 11B

2nd (soph)	ECON 100A	ECON 100B	ECON 113
	ECON 10A	ECON 10B	ECON 110
3rd (junior)	ECON 111A	ECON 111B	ECON 111C
	ECON elective	ECON 112	ECON 116
		Ethics course (optional) *	
4th (senior)	ECON 117B	ECON 117A	
	Field Study internship (optional)	ECON 104 or ECON 197	Field Study (optional)

*Not required for the concentration, but required for California CPA Licensure. At the time of publication, a total of 15 qualified units in ethics is required for the California CPA licensure, 10 of which are satisfied by required courses ECON 112 and ECON 116.

The courses shown above satisfy the MF, PE, and SR and, if ECON 193 is completed, then the PR general education requirements. In addition to the specific courses shown in these planners, a student must complete courses satisfying the UCSC general education requirements.

Sample Transfer Planner

	Fall	Winter	Spring
3rd (junior)	AM 11B/ECON 11B	ECON 100A	ECON 100B
	ECON 111A	ECON 111B	ECON 111C
	Computer literacy course	Ethics course (optional)*	STAT 7 & STAT 7L
4th	ECON 113	ECON 101,	ECON

(senior)	ECON 133 or ECON 135	110	
	ECON 117B	ECON 117A	ECON 116
	ECON UD elective	ECON 112	ECON 104 or ECON 197 (DC)

*Not required for the concentration, but required for California CPA Licensure. At the time of publication, a total of 15 qualified units in ethics is required for the California CPA licensure, 10 of which are satisfied by required courses ECON 112 and ECON 116.

This planner assumes that a student has completed ECON 10A, ECON 10B and major preparation requirements (ECON 1, ECON 2 and at least first calculus course) before coming to UCSC. In addition to the specific courses shown in these planners, a student must complete courses satisfying the UCSC general education requirements.

GLOBAL ECONOMICS B.A.

Information and Policies

Introduction

Global economics is an economics major focusing on global issues with an interdisciplinary element. It is designed to prepare students to understand and participate in the global economy; the program aims to deepen the student's knowledge of economics within a culturally and linguistically diverse world. The major is particularly useful to students contemplating careers at home or overseas in international relations, in international business, or with international organizations. Hence the major requires overseas study, regional area study, and second-language proficiency in addition to the basic economics requirements and additional emphasis in international economics.

Academic Advising for the Program

The Economics Department office is located at 401 Engineering 2. There are two staff undergraduate advisors, peer advisors (except summer), a field study coordinator, as well as a faculty director for each of the Economics Department's undergraduate programs. Our faculty, staff advisors and peer advisors play an important role in advising on all aspects of the major and assisting you to maximize your educational opportunities. Please check the department website for more information about drop-in hours.

Getting Started in the Major

The economics curriculum begins at the introductory level: no specific high school preparation is required. All

majors study a substantial core of economic theory and statistical methods and they then choose among a wide variety of subfields.

Program Learning Outcomes

Program learning outcomes for economics, economics and mathematics, business management economics, and global economics majors:

Critical Thinking Skills: Students are expected to be able to apply economic analysis to everyday problems in real world situations, to understand current events and evaluate specific policy proposals, and to evaluate the role played by assumptions in arguments that reach different conclusions to a specific economic or policy problem.

Quantitative Reasoning Skills: Students are expected to understand how to use empirical evidence to evaluate the validity of an economic argument, use statistical methodology, interpret statistical results, and conduct appropriate statistical analysis of data.

Problem-Solving Skills: Students are expected to be able to solve problems that have clear solutions and to address problems that do not have clear answers and explain conditions under which these solutions may be correct.

Specialized Knowledge and Application of Skills: Students are expected to develop critical and quantitative thinking skills specific to business and accounting.

Communication Skills: Students are expected to be able to communicate effectively in written, oral, and graphical form about specific issues, and to formulate well-organized written arguments that state assumptions and hypotheses supported by evidence.

Major Qualification Policy and Declaration Process

Major Qualification

The Economics Department administers four undergraduate majors: economics, business management economics, global economics, and economics/mathematics.

(Qualifications for the environmental/economics combined major differ from above; see environmental studies for details.) Students should declare the major or minor as soon as they have completed these requirements.

Students must complete three courses, with combined GPA of 2.8 or higher, to qualify for entry to the global economics major:

ECON 1	Introductory Microeconomics: Resource Allocation and Market Structure	5
ECON 2	Introductory Macroeconomics: Aggregate Economic Activity	5

and one of the following calculus courses:

AM 11A	Mathematical Methods for Economists I	5
MATH 11A	Calculus with Applications	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5

Appeal Process

Students not eligible for the economics majors may appeal by submitting a letter to the Economics Department. The appeal letter must be filed no later than the first quarter of their junior year. Please check the "Appeals" area on the department web site for further information on declaring a major or appealing ineligibility and deadlines.

How to Declare a Major

Students can initiate the major declaration process by completing the Petition for Major/Minor Declaration and the Academic Planning forms and by supplying evidence of their grades in the three pre-major courses. Candidates must meet major qualifications listed above under "Major Qualification" prior to declaring the major.

Declaration sessions are mandatory for those seeking to declare the major/minor. If you cannot attend a workshop, you must meet with an economics peer advisor first before obtaining signatures from a staff advisor. Workshop schedules and drop-in advising hours are available on the department's website, on our bulletin board outside the office, and in the department office. All students are advised to bring verification of their grades, which can be printed from the student portal, to the declaration of major advising session. Students who do not bring in verification of their grades could have the approval of their petition for major declaration delayed by up to two working days.

Transfer Information and Policy**Transfer Admission Screening Policy**

The following courses or their equivalents are required prior to transfer, by the end of the spring term for students planning to enter in the fall.

- ECON 1, ECON 2 and first quarter of calculus (MATH 11A, MATH 19A or AM 11A/ECON 11A). A minimum GPA of 2.8 must be obtained in these courses. The admissions office screens transfer applicants for meeting major qualification criteria.

In addition, the following courses are recommended prior to transfer to ensure timely graduation.

- completion of calculus sequence (AM 11B or MATH 22 & MATH 23A)
- two years of language study in the student's chosen language

Prospective students are encouraged to prioritize required and recommended major preparation, and may additionally complete courses that articulate to UC Santa Cruz general education requirements as time allows.

Getting Started at UCSC as a Transfer Student

All transfer students must complete the three-course comprehensive requirement (ECON 100A, ECON 100B, ECON 113) and the disciplinary communication requirement (ECON 104 or ECON 197) at UC Santa Cruz. Global economics majors must take at least two of their upper-division economics electives at UCSC. Courses taken for credit elsewhere may not be repeated for credit here.

Students who were admitted under a different proposed major and have advanced standing when they come to UCSC require permission from the department to change into the major. Admission to the major is not guaranteed.

Letter Grade Policy

All classes included for major qualification determination must be taken for a letter grade. If students have not taken a letter grade, they must appeal by submitting a letter to the Economics Department.

The Economics Department allows classes toward major requirements taken for the Pass/No Pass (P/NP) grade notification. We recommend no more than two courses in the major be taken P/NP. Overall no more than 25 percent of a student's UCSC classes can be taken P/NP.

[Optional Catchall]**Course Substitution Policy**

For courses not already articulated through assist.org, students must present their transfer credit summary (available on the student portal) and course syllabi or descriptions to an Economics Department advisor. The department approves courses applicable for economics prerequisites and major requirements. The course substitution form can be found on the department website under "Forms for students."

Double Majors and Major/Minor Combinations Policy**Study Abroad**

UC Education Abroad Program (UCEAP) is the University of California's official study abroad program and a global leader in international education for over 50 years. All the benefits of home—UC credit, grades, and financial aid—travel with you. Approximately 600 UC Santa Cruz students study abroad on UCEAP every year.

Students can petition UCEAP courses to count toward their major or minor requirements. In addition, there are scholarships available and financial aid can be applied to UCEAP programs. UCEAP provides opportunities in:

- 46 countries around the world

- 420 summer quarter, semester or yearlong programs
- Internships, volunteer work, and research programs

Economics at the Autonomous University of Barcelona -- Direct Exchange Program

Located in Spain, the Autonomous University of Barcelona (UAB) is an institution known for its excellent research and teaching. Unlike UCEAP, this direct exchange program through the UC Santa Cruz Economics Department offers the opportunity for students to enroll in three courses that will fulfill economics major requirements and one course outside of economics. Students must take a total of four courses and will receive transfer credit for all courses. Along with enrolling in courses, students may enjoy the renowned architecture, food, and art. This program is open to students who are economics majors in junior or senior class standing and have a 3.0 cumulative GPA or above. Students must also be in good academic standing and 18 years of age or older at the time of departure to Barcelona. Economics courses at UAB may also be taken in Spanish if students have completed two years of university-level Spanish with a minimum GPA of 2.85 in those language courses.

Honors

The Economics Department considers for honors and highest honors students who have completed a major program with superior or exceptional work. Honors decisions are made by the department's honors and scholarship committee.

At the end of each quarter, faculty teaching the upper-division core courses submit to the department a list of students in their respective classes whose performance is at the honors level. At the time of graduation, all students who received an honors designation in one or more of these courses are reviewed by the department's honor committee. The faculty committee looks for a record of excellence in courses offered toward the major, with a strong performance in the upper-division core (theory and econometrics—ECON 100A/ECON 100M, ECON 100B/ECON 100N, and ECON 113) being a necessary condition for honors. Although a GPA is not computed for the economics courses, in general highest honors are awarded to students who have received a grade of at least an "A" throughout their economics program. Honors are awarded to students who have no more than two courses with grades of less than an "A-." Students who have completed a portion of the major at another institution may be asked to submit a transcript for evaluation.

Students interested in being reviewed for honors may request that the department conduct a review, and such requests are always granted.

In general, honors have been awarded to between 10 and 15 percent of each year's graduating class.

[Optional Catchall]

Independent Study

Students are encouraged to petition for independent study on topics of special interest to them. ECON 199, Tutorial, may be used as only one of the upper-division courses required for the major or minor.

Field-Study Program

The Economics Department offers its majors the opportunity to integrate their academic knowledge with career-related work in areas connected to economics or business. The field study program places students in internships under the supervision of a faculty sponsor and a professional at the workplace. Students can select from a wide variety of field placements such as accounting firms, community non-profits, government agencies, brokerage firms, marketing agencies, banks, and businesses in Santa Cruz and beyond. Students apply for field-study a quarter in advance. Participation in the field-study program requires at least junior standing, completion of courses ECON 100A (or ECON 100M), ECON 100B (or ECON 100N), and ECON 113 as well as good academic standing. Students may earn a maximum of 10 academic credits and complete up to two quarters in a field placement. A 5-credit field study requires 12-14 hours per week spent working on internship duties (a 2-credit field study requires 5-6 hours per week spent on internship duties) and completion of an academic project supervised by a faculty sponsor. Time spent toward the academic requirements set by the faculty sponsor is not included in the 12-14 internship hours spent at the field placement.

Along with the training and supervision by a professional at the workplace, students receive guidance from a faculty sponsor who directs their academic project. Students earn credit through the completion of this project and the job supervisor's evaluation of performance. Economics field study courses do not satisfy any upper-division requirements for the major and are available as Pass/No Pass only.

Interested students should make an appointment or stop by the Economics Department at 403C Engineering 2; or email econintern@ucsc.edu.

Combined Majors

The Economics Department offers the following combined majors: economics/mathematics and environmental studies/economics. Requirements for these majors may be reviewed under their separate entries in this catalog.

Requirements and Planners

Course Requirements

ECON 1 and ECON 2, AM 11A/ECON 11A, AM 11B/ECON 11B, ECON 100A (or ECON 100M), ECON 100B (or ECON 100N), ECON 113, and STAT 7 & STAT 7L or equivalent courses are required for all

economics majors and are prerequisites for most upper-division courses. Students are urged to complete these courses as soon as possible. Students who are committed to the major early in their academic career, should plan to complete at least ECON 1, ECON 2, AM 11A/ECON 11A, AM 11B/ECON 11B, STAT 7 & 7L, and preferably ECON 100A, ECON 100B, and ECON 113 by the end of their sophomore year. Students are also encouraged to choose the letter grade option when taking these courses.

Students who major in economics are required to take the following courses:

Lower-Division Courses

All of the following courses:

ECON 1	Introductory Microeconomics: Resource Allocation and Market Structure	5
ECON 2	Introductory Macroeconomics: Aggregate Economic Activity	5

Plus one of the following mathematics content options:

Either these courses

AM 11A	Mathematical Methods for Economists I	5
AM 11B	Mathematical Methods for Economists II	5

or these courses

MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5
MATH 22	Introduction to Calculus of Several Variables	5

or these courses

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
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MATH 19B	Calculus for Science, Engineering, and Mathematics	5
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MATH 23A	Vector Calculus	5
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or these courses

MATH 11A	Calculus with Applications	5
AM 11B	Mathematical Methods for Economists II	5

or these courses

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
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AM 11B	Mathematical Methods for Economists II	5
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Mathematics Content

MATH 11A, MATH 11B, MATH 23A may be taken to satisfy the mathematics content only by petition via the Mathematics Department.

Students who have completed AM 30 will be allowed to use it instead of MATH 22 & MATH 23A by appeal to the Economics Department.

Plus the following statistics courses:

STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
	AND	
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

Enrollment in STAT 7 requires concurrent enrollment in STAT 7L (2-credit lab). Any transfer credit for STAT 7 & STAT 7L will be evaluated on a case-by-case basis.

Foreign Language Study

The global economics major requires a foreign language since students who plan to work in the larger world must have fluency in a language other than English. This language should be relevant to their regional area of interest. Students can meet this requirement by completing two years of university-level language courses or by demonstrating an equivalent level of competence through a recognized language test.

Upper-Division Courses

Choose one of the following courses:

ECON 100A	Intermediate Microeconomics	5
ECON 100M	Intermediate Microeconomics, Math Intensive	5

Plus one of the following courses:

ECON 100B	Intermediate Macroeconomics	5
ECON 100N	Intermediate Macroeconomics, Math Intensive	5

Plus the following course:

ECON 113	Introduction to Econometrics	5
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Plus one of the following disciplinary communication (DC) courses:

ECON 104	Is There Truth in Numbers: The Role of Statistics in Economics	5
ECON 197	Economic Rhetoric: Using Economic Theory and Empirical Evidence in Arguing Policy	5

Additional upper-division requirements.

Four additional upper-division courses are required.

At least one of the four courses must be selected from List 1 below.

In addition, two more courses must be taken from List 2 below.

The fourth course may be any other upper-division economics course except ECON 191, ECON 192, ECON 193, ECON 193F.

Please see the entire economics course list.

List 1

ECON 120	Development Economics	5
ECON 140	International Trade	5
ECON 141	International Finance	5

List 2

ECON 120	Development Economics	5
ECON 121	Economic Growth	5
ECON 126	Why Economics Succeed or Fail: Lessons from Western and Japanese History	5
ECON 131	International Financial Markets	5
ECON 140	International Trade	5
ECON 141	International Finance	5
ECON 142	Advanced Topics in International Economics	5
ECON 143	Policy Issues in the International Economy	5
ECON 148	Latin American Economies	5
ECON 149	The Economies of East and Southeast Asia	5
ECON 188	Management in the Global Economy	5

Area Study

The major requires students to take two additional courses selected from the offerings of departments other than economics in order to learn about the history, political economy, or culture of some other part of the world. These can be lower- or upper-division courses; the courses should focus on the area of the student's language study and overseas study. The Economics Department provides a list of approved courses (p. 599); substitute courses are welcomed when they are part of the student's overseas program or from other UCSC departments, but must be approved by the advisor for the global economics major.

Study Abroad

All students are required to spend at least one term abroad in an approved course of study in their regional area of concentration; students may also choose a year-long program. Typically, a student will do this through the UC Education Abroad Program (UCEAP). Numerous overseas study sites are available through UCEAP.

Students desiring to fulfill their required study abroad through UCEAP must apply directly to the UCEAP office for the selected program and are subject to the admission requirements determined by UCEAP. In countries and at universities where UCEAP programs are not available, students may make their own arrangements for study with the permission of the director of the program. Students may use the time abroad to further their language study, to meet the area study course requirements, to meet some of the upper-division economics course requirements, or to take courses unrelated to the major. Students who are not accepted to an overseas program or who cannot meet the language or area course requirements are advised to complete the general economics major as an alternative.

Electives**Disciplinary Communication (DC) Requirement**

All undergraduate majors must satisfy the campus' disciplinary communication (DC) requirement. The DC requirement in economics is satisfied by completing one of the following courses:

ECON 104	Is There Truth in Numbers: The Role of Statistics in Economics	5
ECON 197	Economic Rhetoric: Using Economic Theory and Empirical Evidence in Arguing Policy	5

Comprehensive Requirement

The comprehensive requirement is satisfied by passing the following intermediate core courses with grades of C or better here at UCSC:

Choose one of the following courses:

ECON 100A	Intermediate Microeconomics	5
ECON 100M	Intermediate Microeconomics, Math Intensive	5

Plus one of the following courses:

ECON 100B	Intermediate Macroeconomics	5
ECON 100N	Intermediate Macroeconomics, Math Intensive	5

Plus the following course:

ECON 113	Introduction to Econometrics	5
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Students may elect to complete a senior thesis with consent of an instructor in addition to completing the intermediate core courses.

Planners**Sample Frosh Planner**

Fall	Winter	Spring
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1st (frosh) MATH 3 or AM 3

Language AM 11A/ECN 11A

Language Language

2nd (soph) ECON 100A

Language STAT 7 & STAT 7L

Language

3rd (junior) Study abroad for at least one quarter.

Students can apply up to two courses from study abroad toward major requirements. Could be upper-division ECON electives or Area Studies or a combination of both.

4th (senior) ECON elective

ECON elective Field Study (optional)

Area Study Field Study Internship (optional)

education requirements. In addition, to the specific courses shown in these planners, a student must complete courses satisfying all UCSC general education requirements.

Sample Transfer Planner

	Fall	Winter	Spring	Summer
3rd (junior)	AM 11B/ECON 11B	ECON 100A	ECON 100B	
	ECON elective	Area Study	ECON elective	
	STAT 7 & STAT 7L		Area Study	

Study abroad (or fall quarter senior year). Students can apply up to two courses from study abroad toward major requirements. Could be upper-division ECON electives or Area Studies or a combination of both.

4th (senior) ECON 113 ECON elective

ECON elective ECON 104 or ECON 197

Field Study (optional) Field Study internship (optional)

The courses shown above satisfy the MF, PE, and SR and, if ECON 193 is completed, then the PR general

nal)

This planner assumes that a student has completed two years of foreign language study, and major preparation requirements (ECON 1, ECON 2 and at least first calculus course) before coming to UCSC. In addition, to the specific courses shown in these planners, a student must complete courses satisfying the UCSC general education requirements. Transfer students are encouraged to complete "core courses," ECON 100A, ECON 113 and ECON 100B by fall of their fourth year. Core courses are offered every summer.

ECONOMICS/MATHEMATICS COMBINED B.A.

Information and Policies

Introduction

The major in economics and mathematics is designed to meet the needs of undergraduate students who plan to pursue doctoral study in economics or business, or who wish to pursue a career as an actuary or other professional requiring a sophisticated understanding of economics and mathematics. The major combines the main undergraduate content of both economics and mathematics within a programmatic structure that joins the two disciplines. It provides a coursework combination required to prepare for an economics doctoral (Ph.D.) program, or for a group of technically demanding professional careers.

Academic Advising for the Program

The Economics Department office is located at 401 Engineering 2. There are two staff undergraduate advisors, peer advisors (except summer), a field study coordinator, as well as a faculty director for each of the Economics Department's undergraduate programs. Our faculty, staff advisors and peer advisors play an important role in advising on all aspects of the major and assisting you to maximize your educational opportunities. Please check the department website for more information about drop-in hours.

Getting Started in the Major

The economics curriculum begins at the introductory level: no specific high school preparation is required. All majors study a substantial core of economic theory and statistical methods and they then choose among a wide variety of subfields.

Program Learning Outcomes

Program learning outcomes for economics, economics and mathematics, business management economics, and global economics majors:

Critical Thinking Skills: Students are expected to be able to apply economic analysis to everyday problems in real world situations, to understand current events and

evaluate specific policy proposals, and to evaluate the role played by assumptions in arguments that reach different conclusions to a specific economic or policy problem.

Quantitative Reasoning Skills: Students are expected to understand how to use empirical evidence to evaluate the validity of an economic argument, use statistical methodology, interpret statistical results, and conduct appropriate statistical analysis of data.

Problem-Solving Skills: Students are expected to be able to solve problems that have clear solutions and to address problems that do not have clear answers and explain conditions under which these solutions may be correct.

Specialized Knowledge and Application of Skills: Students are expected to develop critical and quantitative thinking skills specific to business and accounting.

Communication Skills: Students are expected to be able to communicate effectively in written, oral, and graphical form about specific issues, and to formulate well-organized written arguments that state assumptions and hypotheses supported by evidence.

Major Qualification Policy and Declaration Process

Major Qualification

The Economics Department administers four undergraduate majors: economics, business management economics, global economics, and economics/mathematics. The qualification requirements for major declaration are the same for all four.

Students must complete three courses, with combined GPA of 2.8 or higher, to qualify for entry to the economics/mathematics major:

ECON 1	Introductory Microeconomics: Resource Allocation and Market Structure	5
ECON 2	Introductory Macroeconomics: Aggregate Economic Activity	5

and the following calculus course:

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
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Appeal Process

Students not eligible for the economics majors may appeal by submitting a letter to the Economics Department. The appeal letter must be filed no later than the first quarter of their junior year. Please check the "Appeals" area on the department website for further information on declaring a major or appealing ineligibility and deadlines.

How to Declare a Major

Students can initiate the major declaration process by completing the Petition for Major/Minor Declaration and the Academic Planning forms and by supplying evidence of their grades in the three pre-major courses. Candidates must meet major qualifications listed above prior to declaring the major.

Declaration sessions are mandatory for those seeking to declare the major or minor. If you cannot attend a workshop, you must meet with an economics peer advisor first before obtaining signatures from a staff advisor. Workshop schedules and drop-in advising hours are available online, on our bulletin board outside the office, and in the department office. All are advised to bring in verification of their grades, which can be printed off the student portal, to the declaration of major advising session. Students who do not bring in verification of their grades could have the approval of their petition for major declaration delayed by up to two working days.

Transfer Information and Policy

Transfer Admission Screening Policy

The following courses or their equivalents are required prior to transfer, by the end of the spring term for students planning to enter in the fall: ECON 1, ECON 2 and first quarter of calculus (MATH 19A).

A minimum GPA of 2.8 must be obtained in the courses listed above. The admissions office screens transfer applicants for meeting major qualification criteria.

In addition, the following courses are recommended prior to transfer to ensure timely graduation: the completion of the calculus sequence (MATH 22 or MATH 23A and MATH 23B).

Prospective students are encouraged to prioritize required and recommended major preparation, and may additionally complete courses that articulate to UC Santa Cruz general education requirements as time allows.

Getting Started at UCSC as a Transfer Student

All transfer students must complete the three-course senior comprehensive requirement (ECON 100A, ECON 100B, ECON 113) and the DC requirement at UC Santa Cruz. Economics/mathematics majors must take at least one of their upper-division economics electives at UC Santa Cruz. Courses taken for credit elsewhere may not be repeated for credit here.

Students who were admitted under a different proposed major and have advanced standing when they come to UCSC require permission from the department to change into the major. Admission to the major is not guaranteed.

Students who have met all lower-division requirements through articulations before transferring will need at least six economics and five mathematics upper-division courses at UCSC to complete the major.

Letter Grade Policy

All classes included for major qualification determination must be taken for a letter grade. If students have not taken a letter grade, they must appeal by submitting a letter to the Economics Department.

The Economics Department allows classes toward major requirements taken for the Pass/No Pass (P/NP) grade notification. We recommend no more than two courses in the major be taken P/NP. Overall no more than 25 percent of a student's UCSC classes can be taken P/NP.

[Optional Catchall]

Course Substitution Policy

For courses not already articulated through assist.org, students must present their transfer credit summary (available on the student portal) and course syllabi or descriptions to an Economics Department advisor. The department approves courses applicable for economics prerequisites and major requirements. The course substitution form can be found on the department website under "Forms for students."

Double Majors and Major/Minor Combinations Policy

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Economics at the Autonomous University of Barcelona-- Direct Exchange Program

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have a 3.0 cumulative GPA or above. Students must also be in good academic standing and 18 years of age or older at the time of departure to Barcelona. Economics courses at UAB may also be taken in Spanish if students have completed two years of university-level Spanish with a minimum GPA of 2.85 in those language courses.

Honors

The Economics Department considers for honors and highest honors students who have completed a major program with superior or exceptional work. Honors decisions are made by the department's honors and scholarship committee.

At the end of each quarter, faculty teaching the upper-division core courses submit to the department a list of students in their respective classes whose performance is at the honors level. At the time of graduation, all students who received an honors designation in one or more of these courses are reviewed by the department's honor committee. The faculty committee looks for a record of excellence in courses offered toward the major, with a strong performance in the upper-division core (theory and econometrics—ECON 100A/ECON 100M, ECON 100B/ECON 100N, and ECON 113) being a necessary condition for honors. Although a GPA is not computed for the economics courses, in general highest honors are awarded to students who have received a grade of at least an "A" throughout their economics program. Honors are awarded to students who have no more than two courses with grades of less than an "A-." Students who have completed a portion of the major at another institution may be asked to submit a transcript for evaluation.

Students interested in being reviewed for honors may request that the department conduct a review, and such requests are always granted.

In general, honors have been awarded to between 10 and 15 percent of each year's graduating class.

[Optional Catchall]

Independent Study

Students are encouraged to petition for independent study on topics of special interest to them. ECON 199, Tutorial, may be used as only one of the upper-division courses required for the major or minor.

Field-Study Program

The Economics Department offers its majors the opportunity to integrate their academic knowledge with career-related work in areas connected to economics or business. The field-study program places students in internships under the supervision of a faculty sponsor and a professional at the workplace. Students can select from a wide variety of field placements such as accounting firms, community non-profits, government agencies, brokerage firms, marketing agencies, banks, and businesses in Santa Cruz and beyond. Students apply for field-study a quarter in advance. Participation in the field study program requires at least junior standing,

completion of courses ECON 100A (or ECON 100M), ECON 100B (or ECON 100N), and ECON 113 as well as good academic standing. Students may earn a maximum of 10 academic credits and complete up to two quarters in a field placement. A 5-credit field study requires 12-14 hours per week spent working on internship duties (a 2-credit field-study requires 5-6 hours per week spent on internship duties) and completion of an academic project supervised by a faculty sponsor. Time spent toward the academic requirements set by the faculty sponsor is not included in the 12-14 internship hours spent at the field placement.

Along with the training and supervision by a professional at the workplace, students receive guidance from a faculty sponsor who directs their academic project. Students earn credit through the completion of this project and the job supervisor's evaluation of performance. Economics field-study courses do not satisfy any upper-division requirements for the major and are available as Pass/No Pass only.

Interested students should make an appointment or stop by the Economics Department at 403C Engineering 2; or e-mail econintern@ucsc.edu.

Combined Majors

The Economics Department offers the following combined majors: economics/mathematics (p. 589) and environmental studies/economics (p. 654). Requirements for these majors may be reviewed under their separate entries in this catalog.

Requirements and Planners

Course Requirements

Lower-Division Courses

Economics Required Courses

All of the following lower-division courses:		
ECON 1	Introductory Microeconomics: Resource Allocation and Market Structure	5
ECON 2	Introductory Macroeconomics: Aggregate Economic Activity	5

Mathematics Required Courses

All of the following lower division courses:

MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 21	Linear Algebra	5

Plus one of the following options:

Either this course			
MATH 22	Introduction to Calculus of Several Variables	5	
or these courses			
MATH 23A	Vector Calculus	5	
MATH 23B	Vector Calculus	5	

Plus the following statistics courses:

STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5	
AND			
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2	

MATH 11A, MATH 11B, MATH 23A may be taken to satisfy the mathematics content only by petition via the Mathematics Department.

Any transfer credit for STAT 7 and STAT 7L will be evaluated on a case-by-case basis.

Upper-Division Courses**Economics Required Courses****Choose one of the following courses:**

ECON 100A	Intermediate Microeconomics	5	
ECON 100M	Intermediate Microeconomics, Math Intensive	5	

Plus one of the following courses:

ECON 100B	Intermediate Macroeconomics	5	
ECON 100N	Intermediate Macroeconomics, Math Intensive	5	

Plus the following course:

ECON 113	Introduction to Econometrics	5	
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Mathematics Required Courses**Plus all of the following courses:**

MATH 100	Introduction to Proof and Problem Solving	5	
MATH 105A	Real Analysis	5	

Electives**Economics Elective Courses**

(choose two from the following list)

NOTE: Lecture/lab combinations (i.e., ECON 114 and ECON 114L) count as one course.

ECON 101	Managerial Economics	5
ECON 114	Advanced Quantitative Methods	5
ECON 114L	Advanced Quantitative Methods Lab	2
ECON 115	Introduction to Management Sciences	5
ECON 120	Development Economics	5
ECON 121	Economic Growth	5
ECON 124	Machine Learning for Economists	5
ECON 125	Economic History of the U.S	5
ECON 126	Why Economies Succeed or Fail: Lessons from Western and Japanese History	5
ECON 128	Poverty and Public Policy	5
ECON 130	Money and Banking	5
ECON 131	International Financial Markets	5
ECON 133	Security Markets and Financial Institutions	5
ECON 135	Corporate Finance	5
ECON 136	Business Strategy	5
ECON 138	The Economics and Management of Technology and Innovation	5
ECON 139A	The Economics of Electronic Commerce	5
ECON 139B	E-Commerce Strategy	5
ECON 140	International Trade	5
ECON 141	International Finance	5
ECON 142	Advanced Topics in International Economics	5
ECON 148	Latin American Economics	5
ECON 149	The Economies of East and Southeast Asia	5
ECON 150	Public Finance	5
ECON 156	Health Care and Medical Economics	5
ECON 159	The Economics of Organizations	5
ECON 160A	Industrial Organization	5
ECON 160B	Government and Industry	5
ECON 161A	Marketing	5
ECON 164	Economics and the Telecommunications Industry	5
ECON 165	Economics as an Experimental Science	5
ECON 166A	Game Theory and Applications I	5
ECON 166B	Game Theory and Applications II	5
ECON 169	Economic Analysis of the Law	5
ECON 170	Environmental Economics	5
ECON 171	Natural Resource Economics	5
ECON 175	Energy Economics	5

ECON 180	Labor Economics	5
ECON 183	Women in the Economy	5
ECON 188	Management in the Global Economy	5

Mathematics Electives

(choose three from the following list)

NOTE: Lecture/lab combinations (i.e., MATH 145 and MATH 145L, MATH 148 and MATH 148L) count as one course.

MATH 105B	Real Analysis	5
MATH 106	Systems of Ordinary Differential Equations	5
MATH 107	Partial Differential Equations	5
MATH 114	Introduction to Financial Mathematics	5
MATH 117	Advanced Linear Algebra	5
MATH 124	Introduction to Topology	5
MATH 145	Introductory Chaos Theory	5
MATH 145L	Introductory Chaos Laboratory	1
AM 114	Introduction to Dynamical Systems	5
STAT 131	Introduction to Probability Theory	5
STAT 132	Classical and Bayesian Inference	5
AM 147	Computational Methods and Applications	5
MATH 115	Graph Theory	5
MATH 116	Combinatorics	5
MATH 134	Cryptography	5
MATH 152	Programming for Mathematics	5
MATH 148	Numerical Analysis	5
MATH 148L	Numerical Analysis Laboratory	1

Disciplinary Communication (DC) Requirement

All undergraduate majors must satisfy the campus' Disciplinary Communication (DC) requirement. The DC requirement in the economics/mathematics combined major is satisfied by completing either :

One of the following

ECON 104	Is There Truth in Numbers: The Role of Statistics in Economics	5
ECON 197	Economic Rhetoric: Using Economic Theory and Empirical Evidence in Arguing Policy	5

Or

The following course

MATH 100	Introduction to Proof and Problem Solving	5
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Plus one of the following courses

MATH 194	Senior Seminar	5
MATH 195	Senior Thesis	5

Comprehensive Requirement

The comprehensive requirement is satisfied by passing the following intermediate core courses with grades of C or better here at UCSC:

Choose one of the following courses:

ECON 100A	Intermediate Microeconomics	5
ECON 100M	Intermediate Microeconomics, Math Intensive	5

Plus one of the following courses:

ECON 100B	Intermediate Macroeconomics	5
ECON 100N	Intermediate Macroeconomics, Math Intensive	5

Plus the following course:

ECON 113	Introduction to Econometrics	5
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Planners

Sample Frosh Planner

1st (frosh)	Fall	Winter	Spring
	MATH 19A	MATH 19B	ECON 2
		ECON 1	
2nd (soph)	MATH 23A	ECON 100A	ECON 100B
	MATH 21	MATH 23B	MATH 100
3rd (junior)	MATH 105A	ECON 113	Econ elective
	STAT 7 & STAT 7L	Math elective	Math elective
4th (senior)	Econ elective	Math elective	Field Study (optional)

ECON 104
or
ECON 197

Field Study
internship

(optional)

The courses shown above satisfy the MF, PE, and SR and, if ECON 193 is completed, then the PR general education requirements. In addition, to the specific courses shown in these planners, a student must complete courses satisfying all UCSC general education requirements.

Sample Transfer Planner One

	Fall	Winter	Spring
3rd (junior)	MATH 19B	MATH 22 or MATH 23A	MATH 23B*
	MATH 21	MATH 100	Math elective
	Econ elective		
4th (senior)	ECON 100A	ECON 113	ECON 100B
	MATH 105A	Econ elective Math elective	Math elective ECON 104 or ECON 197

*If MATH 23A is taken in the winter term, otherwise ECON 100A

This planner assumes that a student has completed the following major requirements: ECON 1, ECON 2, MATH 19A. In addition, to the specific courses shown in these planners, a student must complete courses satisfying the UCSC general education requirements.

Sample Transfer Planner Two

	Fall	Winter	Spring
3rd (junior)	ECON 100A	ECON 100B	ECON 113
	MATH 23B	MATH 21	MATH 100
4th (senior)	MATH 105A	Econ elective	Econ elective
	Math elective	ECON 104 or ECON 197	Math elective
		Math elective	Field Study (optional)

This planner assumes that the student has completed the following major requirements: ECON 1, ECON 2, MATH 19A, MATH 19B, MATH 23A. In addition to the specific courses shown in these planners, a student must

complete courses satisfying the UCSC general education requirements.

ECONOMICS MINOR**Course Requirements**

Students earn a minor in economics by completing the following requirements:

Lower-Division Courses**Take these courses**

ECON 1	Introductory Microeconomics: Resource Allocation and Market Structure	5
ECON 2	Introductory Macroeconomics: Aggregate Economic Activity	5

Plus one of the following options

Either these courses		
AM 11A	Mathematical Methods for Economists I	5
AM 11B	Mathematical Methods for Economists II	5
or these courses		
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5
MATH 22	Introduction to Calculus of Several Variables	5
or these courses		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 23A	Vector Calculus	5

Plus the following statistics courses:

STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

Any transfer credit for STAT 7 & STAT 7L will be evaluated on a case-by-case basis.

Upper-Division Courses**Choose one of the following courses:**

ECON 100A	Intermediate Microeconomics	5
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ECON 100M	Intermediate Microeconomics, Math Intensive	5
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Plus one of the following courses:

ECON 100B	Intermediate Macroeconomics	5
ECON 100N	Intermediate Macroeconomics, Math Intensive	5

Plus the following course:

ECON 113	Introduction to Econometrics	5
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Three additional upper-division economics electives.

Courses ECON 191, ECON 192, ECON 193, and ECON 193F may not be used to meet minor requirements.

APPLIED ECONOMICS AND FINANCE M.S.**Introduction**

The M.S. program in applied economics and finance is a one-year program that provides analytical graduate training designed to prepare students for careers in business, international and domestic banking, consulting firms, government, and nonprofit organizations. The program combines core training in economic theory with meaningful applications that students are likely to face in their professional careers. The program has a more applied orientation than a typical M.A. program in economics and provides more training in economics, statistics, and econometrics than most M.B.A. programs. The curriculum stresses mastery of core principles in micro and macroeconomics and finance. In addition, each student learns how to solve practical problems and to communicate the results clearly. The emphasis of the program, and perhaps its greatest strength, is exposing students to advanced econometric techniques, statistical software packages (R, Stata, etc.), and large-scale financial and microeconomic datasets throughout their coursework.

International students in the M.S. program are eligible to apply for optional practical training (OPT) through the Office of International Education. Our M.S. program in applied economics and finance is also eligible for the OPT STEM Extension. For more information please visit the International Scholar and Student Services website.

Past graduates of this program have gone on to successful careers in the private and public sectors with placements at a diverse range of companies and institutions, including ADM Associates, Inc., Anderson Tax, SoFi, Cisco Systems, Seagate Technology, Google, Sony Computer Entertainment, Plantronics, Wells Fargo, Securities and Exchange Commission, all of the big four accounting firms, McKesson Corp., Pepsi Corp., Visa, Square Trade, the California Franchise Tax Board,

Guardian News (UK), Blue Cross, the World Bank, Stanford University, and the Bank of Japan. Other graduates have gone on to earn Ph.D.s in economics.

Requirements**Course Requirements**

M.S. students are required to take the following classes starting in the fall quarter of the academic year they enroll in the program. Students may also take additional classes if they desire.

Courses and Program Requirements**Fall**

ECON 200	Microeconomic Analysis	5
ECON 216	Applied Econometric Analysis I	5
ECON 233	Finance I	5
ECON 294A	Applied Economics and Finance Laboratory	2
ECON 186	Mathematical Methods for Economic Analysis	5

ECON 186 Note: M.S. students are strongly encouraged to enroll in ECON 186, a three-week pre-fall mathematics course, which is highly beneficial to students' success in the program. ECON 186 is offered as an accelerated short course before the start of fall quarter.

Winter

ECON 202	Macroeconomic Analysis	5
ECON 294A	Applied Economics and Finance Laboratory	2
ECON 294B	Applied Economics and Finance Seminar Master's elective AND	2
ECON 217	Applied Econometric Analysis II	5
or these courses		
ECON 114	Advanced Quantitative Methods	5
ECON 114L	Advanced Quantitative Methods Lab	2

Spring

ECON 201	Applications in Microeconomics	5
ECON 236	Financial Engineering Master's elective	5
ECON 294B	Applied Economics and Finance Seminar	2

Electives

Students may satisfy the elective requirements by taking approved courses within the Economics Department or from another discipline. The department has assembled a list of pre-approved master's electives (curricular offerings are subject to change annually). Students will need to file a departmental petition for review and

approval of courses that are not on the pre-approved elective list.

Pre-Approved M.S. Electives

Please note courses are not offered every quarter or every year.

Economics

ECON 111A	Intermediate Accounting I	5
ECON 111B	Intermediate Accounting II	5
ECON 111C	Intermediate Accounting III	5
ECON 124	Machine Learning for Economists	5
ECON 188	Management in the Global Economy	5
ECON 211C	Advanced Econometrics III	5
ECON 231	International Financial Management	5
ECON 234	Financial Institutions and Markets	5
ECON 235	Corporate Finance	5
ECON 238	Market Design: Theory and Pragmatics	5
ECON 259B	Public Policy Analysis	5

Enrollment in these ECON courses requires permission of instructor: ECON 111A, ECON 111B, ECON 111C, ECON 211C.

Applied Mathematics

AM 216	Stochastic Differential Equations	5
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Computer Science and Engineering (CSE)

CSE 20	Beginning Programming in Python	5
CSE 101	Introduction to Data Structures and Algorithms	5
CSE 102	Introduction to Analysis of Algorithms	5
CSE 182	Introduction to Database Management Systems	5

CSE 20 Note: As it is a lower-division course, CSE 20 does not count toward the 35 credits required by the university to obtain a master's degree. However, since it broadens the skill-set of students in the program, we allow for it as a master's elective to satisfy department requirements. Before enrolling in this course, students should take care to ensure that they will have 35 eligible credits for graduation.

CSE Pre-Approved course electives (require permission of instructor)

CSE 111	Advanced Programming	5
CSE 142	Machine Learning	5
CSE 201	Analysis of Algorithms	5
CSE 202	Combinatorial Algorithms	5

CSE 243	Data Mining	5
CSE 270B	Management of Technology II	5
CSE 271	E-Business Technology and Strategy	5
CSE 272	Information Retrieval	5
CSE 277	Random Process Models in Engineering	5

Enrollment in these computer science and engineering courses requires permission of instructor: CSE 111, CSE 142, CSE 201, CSE 202, CSE 243, CSE 270B, CSE 271, CSE 272, CSE 277.

Environmental Studies

ENVS 140	National Environmental Policy	5
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Statistics

STAT 206	Applied Bayesian Statistics	5
STAT 206B	Intermediate Bayesian Inference	5
STAT 207	Intermediate Bayesian Statistical Modeling	5
STAT 208	Linear Statistical Models	5
STAT 226	Spatial Statistics	5

Other Requirements

Students must pass a comprehensive capstone requirement to receive their degree. This capstone requirement consists of a comprehensive examination, which will take place within two weeks of spring graduation. Students who do not pass the June examination may take it again in August at a date scheduled by the department. Further attempts at passing the comprehensive examination will be approved by the master's committee on an appeal-only basis, with appeals only given for extraordinary or extenuating circumstances.

Students may choose an emphasis in their comprehensive exam requirement based on their academic and professional interests, as reflected in their choices. The applied microeconomics and finance exams, respectively, will consist of one section each from the following courses:

Applied Microeconomics (complete 4 of 5 sections):

- ECON 200*
- ECON 201*
- ECON 216
- ECON 217
- ECON 259B

Finance (complete 4 of 5 sections)

- ECON 231
- ECON 233*

- ECON 234
- ECON 235
- ECON 236*

To complete the capstone exam requirement, students must declare an intended emphasis for the capstone from the following three options prior to June 1 of their spring quarter:

1. **Applied Microeconomics:** Students must pass the applied microeconomics exam in full, which entails choosing four of the five sections of the exam corresponding to the courses listed above.
2. **Finance Emphasis:** Students must pass the finance exam in full, which entails choosing four of the five sections of the exam corresponding to the courses listed above.
3. **General Emphasis:** Students must pass the core components of both exams, two in applied microeconomics and two in finance, for a total of four sections (see courses designated by *).

For those students who have specific research interests and have distinguished themselves in their coursework, a faculty-sponsored research project and thesis may replace the comprehensive examination requirement. This track requires approval of a faculty advisor and the master's degree committee prior to Feb. 1 of the student's initial winter quarter.

Academic Progress

Along with enrolling in the necessary number of units, students are expected to maintain satisfactory academic standing during their time at UC Santa Cruz. Students not making satisfactory progress will be placed on academic probation, and students will be dismissed from the program if they do not remove their probationary status within one quarter. For example, if a student is placed on probation starting in the winter quarter, they must improve to the extent that their probationary status is removed by the beginning of the spring quarter.

Specifically, a student will be placed on academic probation if they fail any of the core (i.e., non-elective), 5-credit courses in the program. Students will be dismissed from the program if they fail core courses in consecutive quarters. The core courses are: ECON 200, ECON 202, ECON 216, ECON 233, and ECON 217 OR ECON 114/ECON 114L.

Note that probation and dismissal can only be formally issued by the Graduate Division (under recommendation from the Economics Department). More details on these procedures, as well as student's right to appeal such decisions, can be found in the Graduate Division Handbook.

Applying for Graduation

By the end of the second week of instruction in the quarter you intend to graduate, you must file

an "Application for Degree" form with the Division of Graduate Studies.

ECONOMICS PH.D.

Introduction

The Ph.D. program in economics provides students with training in modern microeconomics, macroeconomics, and econometrics, combined with specialized training in the fields of international finance, international trade, economic development, monetary economics, applied microeconomics, experimental economics, and other areas.

Advancement to Candidacy

Course Requirements

First-year Ph.D. students are required to enroll in the following courses:

- ECON 210B*, and the three sequences:
- ECON 204A-ECON 204B-ECON 204C, Advanced Micro Theory I-II-III;
- ECON 205A-ECON 205B-ECON 205C, Advanced Macro Theory I-II-III; and
- ECON 211A-ECON 211B-ECON 211C, Advanced Econometrics I-II-III.

* Scheduled in pre-fall as a three-week math camp that precedes the start of fall quarter. The three sequences are taken during the traditional academic year.

Second-year Ph.D. students are required to complete two field sequences, and take 30 units of coursework in the second year. Only two courses per topic are needed to satisfy one sequence. Students may choose one of the following sequences:

- International Trade I-II (ECON 240A-ECON 240B),
- Advanced International Finance I-II-III (ECON 241A-ECON 241B-ECON 241C),
- Development Economics I-II (ECON 220A-ECON 220B),
- Advanced Methods in Macroeconomics I-II-III (ECON 221A-ECON 221B-ECON 221C),
- Applied Microeconomics I-II-III (ECON 250A-ECON 250B-ECON 250C), and
- Experimental Economics (ECON 238*, ECON 270, ECON 272*);

*Normally offered in alternate years

Students are required to submit a second-year field paper which is **due on Aug. 31**, just before the start of the third year. The department's graduate online handbook details the evaluation procedure for the field papers.

Third-year Ph.D. students must attempt and pass the Oral Qualifying Exam by the end of the spring quarter (of the third year). In addition, students must enroll in a workshop focused on advanced topics in their field of interest: ECON 274, ECON 275, or ECON 276. In addition, students enroll in ECON 299B, Doctoral Thesis Research (10 units), under their advisor.

Fourth-year Ph.D. students and beyond are focused on their dissertation research and enroll in ECON 299B, Doctoral Thesis Research (10 credits), and a workshop focused on advanced topics in their field of interest: ECON 274, ECON 275, or ECON 276.

All graduate courses must be taken for letter grade with the exception of ECON 210B, ECON 274, ECON 275, ECON 276 and courses numbered ECON 293 and higher. Only courses with a letter grade of B- or higher can be counted toward the degree requirements.

Ph.D. Courses and Program Requirements

First Year

ECON 204A	Advanced Microeconomic Theory I	5
ECON 204B	Advanced Microeconomic Theory II	5
ECON 204C	Advanced Microeconomic Theory III	5
ECON 205A	Advanced Macroeconomic Theory I	5
ECON 205B	Advanced Macroeconomic Theory II	5
ECON 205C	Advanced Macroeconomic Theory III	5
ECON 211A	Advanced Econometrics I	5
ECON 211B	Advanced Econometrics II	5
ECON 211C	Advanced Econometrics III	5
ECON 210B	Mathematical Methods for Economic Analysis	5

Second Year

Complete 30 units of coursework and complete two field sequences.

ECON 220A	Development Economics I	5
ECON 220B	Development Economics II	5
ECON 221A	Advanced Methods in Macroeconomics I	5
ECON 221B	Advanced Methods in Macroeconomics II	5
ECON 238	Market Design: Theory and Pragmatics	5
ECON 240A	International Trade I	5
ECON 240B	International Trade II	5
ECON 241A	Advanced International Finance I	5

ECON 241B	Advanced International Finance II	5
ECON 241C	Advanced International Finance III	5
ECON 250A	Applied Microeconomics I	5
ECON 250B	Applied Microeconomics II	5
ECON 270	Advanced Topics in Applied Microeconomics	5
ECON 272	Evolutionary Game Theory	5

*Not all field sequences are offered every year or in the same quarter each year.

Third Year

ECON 274	Workshop in Macroeconomics and Monetary Economics	3
ECON 275	Workshop in Applied Microeconomics	3
ECON 276	Workshop in Experimental Economics	3
ECON 299B	Doctoral Thesis Research	10

Fourth Year and Beyond

ECON 274	Workshop in Macroeconomics and Monetary Economics	3
ECON 275	Workshop in Applied Microeconomics	3
ECON 276	Workshop in Experimental Economics	3
ECON 299B	Doctoral Thesis Research	10

Foreign Language Requirements

Teaching Requirement

Pre-Qualifying Requirements

First-year students take two written preliminary examinations; one each in Micro and Macro, in the second week after final exams in June. Students who do not pass either exam may attempt the exam again in September at a date scheduled by the department. Students who fail either exam twice are not allowed to continue in the program.

Second-year students must complete a field paper that consists of original research demonstrating the student's readiness to undertake the Ph.D. in economics. The paper is due on Aug. 31 in the summer after the second year in the program.

Qualifying Examination

Advancement to candidacy for the Ph.D. degree requires completion with satisfactory grades or better of the required coursework, preliminary examinations, the field paper, and the oral examination. The oral examination is taken after all other requirements have been completed. A

student cannot advance to candidacy before clearing any incomplete grades from their record. Students are expected to complete the oral qualifying examination (QE) during the spring quarter of their third year.

Post-Qualifying Requirements

[Optional Catchall]

Dissertation

Dissertation

The final requirement for the Ph.D. degree is acceptance of the student's dissertation under the rules of the Academic Senate. A three-member dissertation advisory committee, headed by the student's research advisor, evaluates the dissertation for the department. The dissertation advisory committee must be approved by both the economics Ph.D. committee and the Graduate Division. The committee may require a formal public defense of the dissertation.

Dissertation Defense

Academic Progress

The main requirements for the program are as follows:

- Students must pass all first year courses.
- Students must pass the micro and macro preliminary exams within the maximum 2 attempts.
- Students must pass the 2nd-year paper, due on Aug. 31 in the summer after the second year.
- Students must pass the oral qualifying exam. This is expected to be completed by the end of the spring quarter of the third year.
- Students must pass a workshop in each quarter in years three and above.

Students who fail to meet any of these requirements within the timeline specified will be placed on academic probation with the Graduate Division. Students who fail to rectify the terms of their probation within the timeline specified in their probation will be dismissed from the program. Note that probation and dismissal can only be formally issued by the Graduate Division (under recommendation from the Economics Department). More detail on these procedures, as well as student's right to appeal such decisions, can be found in the Graduate Division Handbook. The minimum residency requirement for a Ph.D. degree at UC Santa Cruz is six quarters. To receive a graduate degree from UC Santa Cruz, you must be registered at the Santa Cruz campus for at least three of the six quarters. A minimum of one quarter in residence must elapse between advancement to candidacy and awarding of degree.

Applying for Graduation

By the end of the second week of instruction in the quarter you intend to graduate, you must file an "Application for Degree" form with the Division of Graduate Studies.

[Optional Catchall]

ECONOMICS COURSE LIST

Area Studies

List of Approved Courses

Master list of area studies courses for global economics major

Africa

ANTH 130A	Anthropology of Africa.	5
FMST 194G	Images of Africa	5
HISC 264	The Idea of Africa	5
HIS 30	The Making of Modern Africa	5
HIS 137A	Africa to 1800	5
HIS 137B	Africa from 1800 to the Present	5
HIS 137C	African Cinema	5
HIS 158C	Slavery in the Atlantic World: Historical and Archaeological Perspectives	5
HIS 190N	Topics in African History	5
MUSC 80Q	A Survey of African Music	5
POLI 146	The Politics of Africa	5

Middle East

ANTH 130T	Religion and Politics in the Muslim World	5
ANTH 148	Gender and Global Development	5
HIS 41	The Making of the Modern Middle East	5
HIS 155	History of Modern Israel	5
HIS 156A	Art, Culture, and Mass Media in the Arab Middle East	5
MUSC 80I	Music of Modern Israel	5

Latin America

ANTH 130B	Brazil	5
ANTH 130L	Ethnographies of Latin America	5
ANTH 130U	Central America	5
HIS 11A	Latin America: Colonial Period	5
HIS 11B	Latin America: National Period	5
HIS 130	History of Modern Cuba	5

HIS 178B	European Intellectual History: The 19th Century	5
HIS 183A	Nineteenth-Century Italy	5
LIT 183D	Die deutsche Romantik	5
POLI 140A	European Politics	5
SPAN 156E	Spanish Culture	5

Russia

ANTH 130H	Ethnography of Russia and Eastern Europe	5
HIS 196O	Russian Revolution, 1917-1932	5
POLI 142	Russian Politics	5

Education

McHenry Library
 Advising: education@ucsc.edu
<https://education.ucsc.edu/>

PROGRAMS OFFERED

Education, Democracy, and Justice B.A. (p. 602)

Education Minor (General) (p. 606)

Science, Technology, Engineering, and Mathematics (STEM) Education Minor (p. 607)

Science Education and Education MA/C Contiguous Bachelor's/Master's Pathway (p. 609)

Critical Race and Ethnic Studies (CRES) MA/C Contiguous Bachelor's/Master's Pathway (p. 608)

Education M.A. and California Teacher Credential Program (p. 610)

Education Ph.D. (p. 615)

Education Designated Emphasis (p. 618)

OTHER PROGRAMS OF INTEREST

Science Education B.S. (p. 398)

Mathematics Education B.A. (p. 341)

The purpose of the Education Department's instructional programs is to prepare all students—both undergraduates and graduates—to engage in the analysis and integration of educational theory, research, and practice for an increasingly diverse society. Our commitment is built around four interrelated domains: 1) schools, families, and communities; 2) teacher education and teacher development; 3) language, literacy, and learning; and 4) mathematics and science education. Foundational to our programs is an acknowledgment of the social, cultural, and political contexts in which all aspects of education occur.

The Education Department offers a doctor of philosophy (Ph.D.) program for students who have exemplary academic preparation as well as experience working in

educational settings. We offer a master's level/teaching credential (MA/C) teacher-preparation program; an education major, Education, Democracy and Justice B.A.; and we have two vibrant undergraduate education minor tracks, the education minor and the STEM education minor, that serve more than 300 undergraduates each year.

UNDERGRADUATE PROGRAM

The UC Santa Cruz undergraduate courses in education engage students in histories of educational thought and philosophy, the politics and economics of education, multiple approaches to learning theory and teaching pedagogy, and contemporary issues of cultural and linguistic diversity in education.

The state of California does not allow academic majors in education that lead to a teaching credential. Instead, UC Santa Cruz offers an undergraduate major in education and two minors in education for students who are considering a career in teaching or who hold a more general interest in educational studies. Please note that the major and minors in education do not provide a California Teaching Credential. Additionally, please note that the UC Santa Cruz teaching credential program is a graduate program and coursework taken in the major or minor cannot be substituted for credential requirements, except in specifically designated pathways.

In addition to students with a general interest in educational studies, the undergraduate major in education is an option for students considering a career in K-6 teaching and planning to enter a credential program after undergraduate degree completion. Students in other majors who are considering a career in K-6 or 7-12 teaching should start planning in their junior year. Find out more about K-12 school teaching careers here.

GRADUATE PROGRAMS

The master of arts (M.A.) in education and California teaching credential program prepares prospective teachers to work with California's culturally and linguistically diverse student population. Students in this program earn a master's degree and are eligible to apply for a Preliminary California Credential upon completing a 12-month, five-quarter program comprised of two summers and one academic year. Graduates of the program are prepared to teach English language learners enrolled in K-12 public schools. The program also offers the Bilingual Authorization (in Spanish) for primary language instruction or dual language immersion instruction in a K-12 setting.

The goal of the Ph.D. in education is to support graduate students in becoming creative scholars who engage in research focused on the educational needs of students from linguistic and cultural groups that have historically not fared well in our nation's public schools. To achieve this goal, this program provides students with grounding in the varieties of interdisciplinary theorizing, research methods, and applications needed to advance the study of

learning and teaching for diverse student populations. The courses and research experiences are closely related to practice in K-12 classrooms and informal settings. Students in this interdisciplinary program apply tools and perspectives from education, anthropology, linguistics, philosophy, psychology, sociology, cognitive science, and cultural historical activity theory. The program integrates theory and practice to examine learning and teaching within the multiple contexts of classroom, school, family, and community. Graduates of this program will be qualified to teach and to conduct the kinds of educational research demanded by tenure-track positions in research and regional universities. Graduates may also work in non-university based institutions that focus on teacher professional development, curriculum development, and related areas of educational research and development.

EDUCATION, DEMOCRACY, AND JUSTICE B.A.

Information and Policies

Introduction

The Education, Democracy and Justice major (EDJ; pronounced as ‘Edge’) will provide opportunities to examine critical questions, theories, practices, and research in the field of education considered broadly and not only in relation to formal schooling. Courses in the major will provide the conceptual knowledge for students to engage in critical thinking about social and policy contexts as well as everyday practices affecting inequitable structures in schooling, society, and culture that have enduring impacts on the quality of our democracy and communities. The major’s course of study will explore the history and politics of education and public schooling and their relation to the formation of just and democratic societies; theories of cognition, learning, and pedagogy; and issues of equity and cultural and linguistic diversity in education and in public school policies and practices. The major will not focus on education in international contexts but will address the effects of immigration and globalization on U.S. education.

The department faculty and the program’s social justice orientations bridge theory and practice, drawing on a variety of fields and areas of study in the humanities and social sciences—including sociology, psychology, anthropology, history, philosophy—as well as critical interdisciplinary theories and the learning sciences. Core required courses and elective field experiences will incorporate history and insights from action and participatory forms of research and community organizing to highlight the relationship between education and democratic politics. These studies and field experiences will ground students in an understanding of the transformative power of the linguistic, cultural, epistemic, and social resources that individuals, families, social groups, and communities bring to bear on their circumstances, and how these resources provide the

foundations for personal and social change to address historic and enduring inequities that have been barriers to education as a democratic project. The aim of the EDJ major is to provide students with the knowledge, skills, and dispositions to become leaders in their communities who can impact a wide array of educational and social institutions, including schools, and put their combination of coursework, research, and fieldwork experiences to work in improving the lives of the least advantaged to advance the welfare of all.

The Education, Democracy, and Justice (EDJ) major does not provide a professional education degree or teaching credential. However, for students interested in a future career as a K-5 teacher, it will provide a strong background for applying to a master's (M.A. or M.Ed.) teaching credential program. Students interested in 6-8 or 9-12 levels of teaching might wish to double-major in education to provide a strong educational context to support their major in a subject area (e.g. literature, history, science, math) if they intend to apply to a graduate program in teacher education. Students cannot teach in 9-12 grades in California schools with a single major in education. Students who complete the major with at least a 3.0 GPA along with other advised coursework and experiences will be given priority for admission into UCSC’s Master of Arts and Credential program in K-5 (multiple subjects) on the recommendation of the faculty.

The Education, Democracy, and Justice (EDJ) major’s sociocultural perspective emphasizes equity and social justice related education in and out of school, with a particular focus on how cognition, language, and knowledge production, circulation, and mobilization are related to social, cultural, and other identities and their processes of formation. Students will examine critical, transformative pedagogies that focus on meeting the needs of low-income, ethnically, racially, and linguistically non-dominant students and their families, and how these pedagogies support the development of more healthy and flourishing children and youth and a more just and democratic society.

Academic Advising for the Program

Undergraduate Advisor

The undergraduate advisor offers specific information about navigating through the program and the curriculum and assists students with prerequisites, requirements, policies, procedures, learning support, guidance on internships, scholarships, and opportunities for undergraduate research. Please contact the EDJ undergraduate advisor at education@ucsc.edu.

Peer Advisors

Peer advising can assist in academic planning in regards to major and minor requirements, help prepare declaration of major and minor paperwork. Please contact the Education peer advising team at edpeeradvising-group@ucsc.edu.

Transfer Students should also consult the Transfer Information and Policy section below.

Getting Started in the Major

Students interested in pursuing the Education, Democracy, and Justice (EDJ) major should complete EDUC 10, and EDUC 60 and attend a declaration workshop or meet with the department advisor. After completing these requirements, students may petition to declare the education major.

Program Learning Outcomes

1. Students will demonstrate an understanding of the key theoretical perspectives and existing research on innovative teaching and learning approaches that value and promote historically disadvantaged and under-served communities and their cultural and linguistic resources.
2. Students will apply critical perspectives in reflecting on and/or conducting research and/or fieldwork, and present their findings in multi-modal forms.
3. Students will demonstrate knowledge of broad historical, social, and political contexts that impact equal opportunity to learn and contribute to society, and the role that education and schooling can play in expanding opportunity.
4. Students will demonstrate basic knowledge of transformative teaching and learning principles that can be applied in a wide range of learning environments and youth serving educational organizations.
5. Students will demonstrate oral and written communication skills through individual and group presentations and assignments in their courses.
6. Honors students will demonstrate an awareness of problems, current debates, and transformative possibilities related to educational theory, policy, and practice across K-12 schooling and/or some other educational context, and suggest thoughtful solutions through a senior seminar project.

Major Qualification Policy and Declaration Process

Major Qualification

To qualify to declare the EDJ major, students must have:

- Attended an Education, Democracy, and Justice (EDJ) Major Workshop
- Completed EDUC 10, Introduction to Education, and EDUC 60, Schooling, Democracy, and Justice. (Students may still petition to declare if they have completed one required lower-division course and are currently enrolled in the second required lower-division course.)

EDUC 10	Introduction to Learning	5
EDUC 60	Schooling, Democracy, and Justice	5

Appeal Process

Students who are informed that they are not qualified to declare the Education, Democracy, and Justice (EDJ) major may appeal this decision by submitting a letter to the program director within 15 days from the date the notification was made. Within 15 days of receipt of the appeal, the program will notify the student, college, and the Office of the Registrar of the decision.

How to Declare a Major

To officially declare the Education, Democracy, and Justice (EDJ) major, students must bring a completed Petition for Major/Minor Declaration and UC Santa Cruz Academic Planning Form to the Education Department's undergraduate advisor. Students pursuing the EDJ major should meet with the Education Department's undergraduate advisor as early as possible.

For specific instructions about how to declare a major in education and for the current Drop-in Advising Schedule, please refer to the Education Department's website. For other inquiries, please contact the undergraduate advisor by sending an email to education@ucsc.edu.

Transfer Information and Policy

Transfer Admission Screening Policy

Students planning to apply to UC Santa Cruz in the Education, Democracy, and Justice (EDJ) major are not required to complete specific courses for consideration of admission.

Transfer students considering the education major are strongly encouraged to complete most, if not all, general education requirements before transfer. Introductory education courses completed by transfer students at their prior institution will be reviewed to determine equivalency for EDUC 10 and EDUC 60. To ensure that students desiring a transfer to UCSC's EDJ major are on track for meeting these goals, they need to connect with their community college or university advisors for guidance and course planning.

EDUC 10	Introduction to Learning	5
EDUC 60	Schooling, Democracy, and Justice	5

Getting Started at UCSC as a Transfer Student

Transfer students can designate the Education, Democracy, and Justice (EDJ) major as their intended major and begin working on the requirements as soon as they arrive at UCSC.

Transfer students interested in pursuing the education, democracy, and justice (EDJ) major should complete EDUC 10, and EDUC 60 or courses taken at their previous institution that the Education Department

has approved as equivalent. Transfer students should also attend a declaration workshop or meet with the department advisor.

After completing these requirements, students may petition to declare the education major.

Students who wish to pursue the education major should arrange to meet with the education undergraduate advisor as early as possible to discuss plans for enrolling in EDUC 10 and EDUC 60, if needed, declaring the major, and other course planning. Students should bring a copy of their UCSC Transfer Credit Summary to the meeting with the undergraduate advisor. This may be printed from the student portal.

EDUC 10	Introduction to Learning	5
EDUC 60	Schooling, Democracy, and Justice	5

Letter Grade Policy

The Education, Democracy, and Justice (EDJ) major lower-division qualification courses (EDUC 10 and EDUC 60) may be taken for letter grades or Pass/No Pass. All other major requirements may be taken as a letter grade or Pass/No Pass. No more than 25 percent of credits earned at UCSC may be graded on a Pass/No Pass basis. Students must be in good academic standing to choose the Pass/No Pass option.

[Optional Catchall]

Course Substitution Policy

Education, Democracy, and Justice (EDJ) B.A. students may substitute two of the upper-division elective requirements with upper-division electives from other UCSC departments, individual study courses, education abroad electives, or other four-year institution electives. Students are limited in the number of outside electives accepted toward the major and must petition for approval of the course prior to applying it to the major. Review the department's Petition for a Course Exception page for information about the petition process.

Double Majors and Major/Minor Combinations Policy

The department accepts proposals for double majors. A student pursuing a double major meets the full requirements of the Education, Democracy, and Justice (EDJ) major as well as the full requirements of the other major.

Education Abroad Program (EAP)

Students seeking to study abroad must be declared in their major prior to studying abroad.

It is recommended that the students have the courses intended to be taken abroad reviewed and approved by the Education Department prior to departure. Up to two relevant courses taken through study abroad programs from which credits are transferable to UCSC may be used toward satisfaction of the Education, Democracy, and

Justice (EDJ) B.A. elective requirements when the content is deemed appropriate and approved by the Education Department.

Honors

A student with a major GPA of 3.75 or better qualifies for honors in the Education, Democracy, and Justice (EDJ) major. A student with a major GPA of 3.90 or better qualifies for highest honors in the major. Per UCSC policy, no more than approximately 15 percent of the graduating class can be considered for honors or highest honors in the major. Courses and units taken at UCSC to satisfy the major requirements are used to calculate the major GPA. Courses transferred from other institutions (with the exception of study abroad programs through UCSC) are not calculated into major GPA.

[Optional Catchall]

Requirements and Planners

Course Requirements

Education, Democracy, and Justice (EDJ) majors are required to take 10 5-credit courses for a total of 50 credits:

Lower-Division Courses

Both of the following

EDUC 10	Introduction to Learning	5
EDUC 60	Schooling, Democracy, and Justice	5

Upper-Division Courses

One of the following

Students will be required to take either EDUC 110, Popular Education, Democracy, and Social Movements (5 credits); or EDUC 180, Introduction to Teaching (5 credits).

EDUC 110	Popular Education, Democracy, and Social Movements	5
EDUC 180	Introduction to Teaching	5

Plus

Six upper-division electives from the education catalog.

Plus

Successful completion of the comprehensive requirement is required prior to graduation.

EDUC 190	Senior Seminar Capstone	5
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Electives

Beyond the three foundational required courses, all students will take any six (6) upper-division elective courses (30 credits) from from the EDUC course list.

Students may chose to follow an area of emphasis but it is not required. The two areas of emphasis are Social

Contexts and Educational Foundations, and Learning and Teaching.

Students may take both EDUC 110 and EDUC 180. One course will count as the required upper-division course and the other will count toward the six upper-division electives.

Social Contexts and Educational Foundations

EDUC 110 is required

EDUC 102	Education, Media, and Society	5
EDUC 128	Immigrants and Education	5
EDUC 135	Gender and Education	5
EDUC 141	Bilingualism and Schooling	5
EDUC 164	Urban Education	5
EDUC 166	Technology and Education	5
EDUC 160	Issues in Educational Reform	5
EDUC 173	Seminar in Critical Pedagogy	5
EDUC 174	Ethnographic Research in Schools and Communities	5
EDUC 178	Advanced Educational Studies	5
EDUC 181	Race, Class, and Culture in Education	5

Learning and Teaching

EDUC 180 is required

EDUC 104	Ethical Issues and Teaching	5
EDUC 115	K-12 Student Assessment	5
EDUC 120	The Arts in Schools: Aesthetic Education Theory and Practice	5
EDUC 125	Multicultural Children's Literature for Elementary Classrooms	5
EDUC 126	Foundations of Literacy Learning: Contemporary Perspectives	5
EDUC 140	Language, Diversity, and Learning	5
EDUC 177	Teaching Linguistically Diverse Students	5
EDUC 187	Cognition and Instruction	5
EDUC 183	Children's Mathematical Thinking	5
EDUC 182	American Teacher	5
EDUC 166	Technology and Education	5
EDUC 173	Seminar in Critical Pedagogy	5
EDUC 141	Bilingualism and Schooling	5
EDUC 185B	Introduction to Mathematics Education	5
EDUC 185C	Introduction to Teaching Science	5

EDUC 178	Advanced Educational Studies	5
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Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division disciplinary communication (DC) requirement. The DC requirement in Education, Democracy, and Justice B.A. is satisfied by completing EDUC 110 or EDUC 180, and EDUC 190.

One of the following courses

EDUC 110	Popular Education, Democracy, and Social Movements	5
EDUC 180	Introduction to Teaching	5

Plus

EDUC 190	Senior Seminar Capstone	5
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Comprehensive Requirement

EDUC 190 (5 credits) will satisfy the senior capstone requirement with a focus on advanced topics in education, emphasizing at least one of the following: critical and analytical thinking, field research, advanced research methods (qualitative or quantitative), or advanced theory.

EDUC 190	Senior Seminar Capstone	5
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Planners

A four-year course plan for frosh majoring in education, democracy, and justice (EDJ) and a two-year course plan for transfer students are provided below.

Following are two recommended academic plans for frosh, and two plans for transfer students. Plan One is a suggested guideline for frosh who may choose social contexts and educational foundations (EDUC 110 is recommended) as an area of emphasis. Plan Two is for frosh who may choose learning and teaching (EDUC 180 is recommended) as an area of emphasis. The third and fourth planners are suggested two-year guidelines for transfer students. Students may choose to take education electives in summer quarters.

Plan One for Incoming Frosh

Year	Fall	Winter	Spring
1st (frosh)	EDUC 60		EDUC 10
2nd (soph)			
3rd (junior)	EDUC 180	EDUC elective	EDUC elective
		EDUC elective	

4th (senior)	EDUC elective	EDUC elective	EDUC 190
	EDUC elective		

The courses listed above will satisfy the PR-S and DC general education requirements. Other GE requirements may be satisfied by elective courses. All other GE requirements have to be satisfied.

*Articulated equivalent courses may be taken prior to transfer.

The courses listed above will satisfy the PR-S and DC general education requirements. Other GE requirements may be satisfied by elective courses. All other GE requirements have to be satisfied.

Plan Two for Incoming Frosh

Year	Fall	Winter	Spring
1st (frosh)	EDUC 10		EDUC 60

**2nd
(soph)**

3rd (junior)	EDUC elective	EDUC 110	EDUC elective
	EDUC elective		

4th (senior)	EDUC elective	EDUC elective	EDUC 190
	EDUC elective		

The courses listed above will satisfy the PR-S and DC general education requirements. Other GE requirements may be satisfied by elective courses. All other GE requirements have to be satisfied.

Sample Plan One Transfer Planner

Year	Fall	Winter	Spring
3rd (junior)	EDUC 60*	EDUC 180	EDUC 10*
	EDUC elective		EDUC elective
4th (senior)	EDUC elective	EDUC elective	EDUC 190
	EDUC elective	EDUC elective	

Plan Two for Transfer Students

Year	Fall	Winter	Spring
3rd (junior)	EDUC 10*	EDUC 110	EDUC 60*
	EDUC elective		EDUC elective
4th (senior)	EDUC elective	EDUC elective	EDUC 190
	EDUC elective	EDUC elective	

The courses listed above will satisfy the PR-S and DC general education requirements. Other GE requirements may be satisfied by elective courses. All other GE requirements have to be satisfied.

* Approved equivalent courses may be taken prior to transfer.

**EDUCATION MINOR
(GENERAL)**

Declaring the Minor

To officially declare a general minor in education, students must bring a completed Petition for Major/Minor Declaration and UC Santa Cruz Academic Planning Form to the Education Department’s undergraduate advisor. Students pursuing a minor in education should meet with the Education Department’s undergraduate advisor as early as possible.

To be eligible to declare the general minor in education, students must have:

- Attended an Education Minor Workshop or met with the Education undergraduate advisor
- Completed or be enrolled in EDUC 60, Introduction to Education
- Successfully declared a major

For specific instructions about how to declare a minor in education and for the current Drop-in Advising Schedule, please refer to the Education Department’s website. For other inquiries, please contact the undergraduate advisor by sending an email to education@ucsc.edu.

Course Requirements

The general minor in education consists of six courses totaling 30 credits:

Lower-Division Courses

EDUC 60	Schooling, Democracy, and Justice	5
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Upper-Division Courses

EDUC 180	Introduction to Teaching	5
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EDUC 180 includes a 30-hour classroom observation practicum, plus additional travel time to school sites.

For EDUC 180, background checks (Live Scan Fingerprinting), evidence of a negative TB test or Risk Assessment Form, and Online Mandated Reporter training are required of all participants prior to the first day of instruction. The department will contact enrolled students with information about how to complete these items.

Four upper-division elective courses

Education courses other than EDUC 180 numbered EDUC 102-EDUC 187.

Declared minors have priority enrollment for upper-division education courses. Upper-division electives may be taken before EDUC 180.

SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS (STEM) EDUCATION MINOR

The Science, Technology, Engineering, and Mathematics (STEM) education minor specifically serves students in STEM majors who are considering careers in secondary mathematics or science teaching.

Students pursuing the STEM education minor should meet with the Cal Teach staff as early as possible. Entry into EDUC 50 is by application only, and interested students must submit an application to the Cal Teach program (see the Cal Teach website or email calteach@ucsc.edu). Entry into EDUC 100 and EDUC 185L is contingent upon successful completion of previous Cal Teach internships and sufficient university-level science or mathematics coursework.

Declaring the STEM Minor

To officially declare a STEM minor in education, students must bring a completed Petition for Major/Minor Declaration and UC Santa Cruz Academic Planning Form to the Education Department's undergraduate advisor. Students pursuing a minor in education should meet with the Education Department's undergraduate advisor as early as possible.

To be eligible to declare the STEM minor in education, students must have:

- Attended an Education Minor Workshop or met with the Education undergraduate advisor
- Completed or be enrolled in EDUC 50 (which requires being accepted into the Cal Teach Program)
- Completed or be enrolled in EDUC 60, Introduction to Education
- Successfully declared a major

For specific instructions about how to declare a minor in education and for the current Drop-in Advising Schedule, please refer to the Education Department's website. For other inquiries, please contact the undergraduate advisor by sending an email to education@ucsc.edu.

Course Requirements

The STEM minor in education consists of eight courses, totaling 32 credits and including approximately 75 hours of classroom field placements.

Lower-Division Courses

Choose one of the following courses

EDUC 50A	CAL Teach 1: Science and Mathematics	2
EDUC 50B	CAL Teach 1: Mathematics	2
EDUC 50C	CAL Teach 1: Science	2

Plus the following course

EDUC 60	Schooling, Democracy, and Justice	5
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Upper-Division Courses

Choose one of the following courses:

EDUC 100A	Cal Teach 2: Science and Mathematics	2
EDUC 100B	Cal Teach 2: Mathematics	2
EDUC 100C	Cal Teach 2: Science	2

Plus one of the following courses:

EDUC 185B	Introduction to Mathematics Education	5
EDUC 185C	Introduction to Teaching Science	5

Plus the following course:

EDUC 185L	Introduction to Teaching: Cal Teach 3	3
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Plus one upper-division education course addressing cultural and linguistic diversity:

EDUC 125	Multicultural Children's Literature for Elementary Classrooms	5
EDUC 128	Immigrants and Education	5
EDUC 135	Gender and Education	5
EDUC 140	Language, Diversity, and Learning	5

EDUC 141	Bilingualism and Schooling	5
EDUC 164	Urban Education	5
EDUC 170	East Asian Schooling and Immigration	5
EDUC 171	South and Southeast Asian Schooling and Immigration	5
EDUC 177	Teaching Linguistically Diverse Students	5
EDUC 181	Race, Class, and Culture in Education	5

Plus two upper-division education courses

Courses numbered EDUC 102-EDUC 187. Please refer to the Education Department's website for a list of approved upper-division courses being offered during the current academic year.

CRITICAL RACE AND ETHNIC STUDIES AND EDUCATION MA/C CONTIGUOUS BACHELOR'S/MASTER'S PATHWAY

The 4+1 pathway into the M.A./Credential Master's program is an option that allows undergraduates in the critical race and ethnic studies (CRES) major at U.C. Santa Cruz to:

- Finish the master's degree in just one additional year (5 Quarters July to July).
- Apply to the Education master's program through a streamlined application process.

Undergraduate students currently enrolled in the CRES major have the opportunity, any time after the start of their junior year until Dec. 1 of their senior year, to apply to be admitted to the 4+1 contiguous pathway leading to the Education Master's Degree.

The requirements for admission into the 4+1 pathway are:

- Undergraduate major in CRES
- A GPA in the major of 3.0 or more
- Overall GPA of 3.0 or higher
- Junior or senior standing
- Complete two upper-division courses selected from the following with a grade of B or higher: EDUC 104, EDUC 115, EDUC 125, EDUC 126, EDUC 135, EDUC 141, EDUC 160, EDUC 162, EDUC 164, EDUC 174, EDUC 177.

Interested students should schedule a meeting with the CRES undergraduate advisor to discuss their curriculum plan and complete the application forms. The deadline for application to the pathway is Dec. 1 of the senior year, although students are encouraged to apply earlier.

While students in the pathway are not guaranteed admission to the MA/Credential Program, the Education Department expects to admit students who:

1. have met the requirements for admission to the 4+1, above;
2. have classroom experience with youth; and
3. have a commitment to teaching in communities serving traditionally underserved populations, barring any extenuating circumstances, or if the applicant does not obtain clearance from the State of California. Additionally, students will be eligible for a streamlined admission process if, at the time of application, they have met the state Basic Skills and Subject Matter requirements, typically by providing passing scores on California state tests: the CBEST and the CSET (applicants must pass the required subtests for a secondary Single Subject Social Science credential or the Multiple Subjects credential).

CSET Social Science consists of three subtests:

- Social Science Subtest I (test code 114)
- Social Science Subtest II (test code 115)
- Social Science Subtest III (test code 116)

CSET Multiple Subjects consists of three subtests:

- Multiple Subjects Subtest I (test code 101)
- Multiple Subjects Subtest II (test code 214)
- Multiple Subjects Subtest III (test code 103)

After entering into the Master's/Credential Program, students from the pathway will follow the same requirements as any other students in the MA/C program with expected graduation in July of the year after their graduation from the UC Santa Cruz CRES program.

Students who have completed one of these identified undergraduate education courses will have the course EDUC 205 waived from their MA/Credential requirements.

- EDUC 102, Education, Media and Society,
- EDUC 128, Immigrants and Education,
- EDUC 140, Language, Diversity & Learning,
- EDUC 173, Critical Pedagogy,
- EDUC 181, Race, Class and Culture in Education.

Students intending to apply for the MA/Credential Program may also choose to complete these courses in Summer Session II between their junior and senior years, instead of during the MA/Credential Program:

- EDUC 210, Health, Safety and Community, 2 credits,

- EDUC 213, Child and Adolescent Development for Educators, 2 credits,

The following State of California requirements for a California teaching credential, which have to be completed before the end of the final quarter of the MA/Credential Program, can also be completed at the undergraduate stage if a student chooses:

- The US Constitution Examination, when offered by the Education Department. (Completion of any of the courses POLI 20, POLI 111A, POLI 120A or HIS 10A also satisfies this requirement.)
- The UC Santa Cruz Extension online course EDUC.XSC209 can be completed any time it is offered to satisfy the Preliminary Technology Requirement.
- A certified cardiopulmonary resuscitation (CPR) course (infant, child, and adult) must be completed before the end of the final quarter of the MA/Credential Program and be valid at the time of application for the preliminary credential in the final summer session of the MA/Credential Program. (A CPR course that will remain valid through the preliminary credential application may be taken during the undergraduate state; 12-month certifications will not be sufficient. Student must check with course provider.)

SCIENCE EDUCATION AND EDUCATION MA/C CONTIGUOUS BACHELOR'S/MASTER'S PATHWAY

The 4+1 pathway into the Master of Arts (M.A.)/Credential Master's program is an option for UC Santa Cruz Science Education majors at U.C. Santa Cruz to apply to the M.A./Credential program through a streamlined application process.

Undergraduate students currently enrolled in the science education major may, any time after the start of their junior year until Dec. 1 of their senior year, apply to be admitted to the 4+1 contiguous pathway leading to the education master's degree and teaching credential.

The requirements for admission into the 4+1 pathway are:

1. a GPA in the major of 3.0 or higher;
2. Completion of EDUC 185C Introduction to Teaching Science, and with a grade of B or better; and
3. Completion or current enrollment or plan to enroll by fall of the senior year in all of the required Cal Teach courses.

Interested students should schedule a meeting with the science education undergraduate advisor to discuss their

curriculum plan and complete the application forms. The deadline for application to the pathway is Dec. 1 of the senior year, although students are encouraged to apply earlier.

While students in the pathway are not guaranteed admission to the M.A./Credential Program, the Education Department expects to admit students who have met the three requirements for admission above, barring any extenuating circumstances or if the applicant does not obtain clearance from the State of California as described in the program statement for the M.A./Credential Master's program. Additionally, students will be eligible for a streamlined admission process if, at the time of application, they have met the state Basic Skills and Subject Matter requirements, typically by providing passing scores on California State tests: the CBEST and the CSET (applicants must pass the required sub tests¹ for a secondary Single Subject Science credential or the Foundational-Level General Science credential).

After entering into the Master's/Credential program, students from the pathway will follow the same requirements as any other students in the M.A./Credential program with expected graduation in July of the year after their graduation from the UCSC Science Education program.

Students who have completed EDUC 177 for the UCSC Science Education program will have the course EDUC 205 waived from their M.A./Credential requirements. Students intending to apply for the M.A./Credential program may also choose to complete EDUC 210 (Health, Safety and Community) and EDUC 213 (Child and Adolescent Development for Educators) in Summer Session II between their junior and senior years, instead of during the M.A./Credential program.

The following State of California requirements for a California teaching credential, which have to be completed before the end of the final quarter of the M.A./Credential program, can also be completed at the undergraduate stage if a student chooses:

- The U.S. Constitution Examination, when offered by the Education Department. Completion of any of the courses POLI 20, POLI 111A, POLI 120A or HIS 10A also satisfies this requirement.
- The UCSC Extension online course EDUC.XSC209.
- A certified cardiopulmonary resuscitation (CPR) course (infant, child, and adult). A CPR course that will remain valid through the preliminary credential application may be taken during the undergraduate state; 12-month certifications will not be sufficient. Students must check with the course provider.

¹CSET Science consists of two subtests: Subtest I (test code 215) and Subtest II -- Life Sciences (test code 217), Chemistry (test code 218), Earth and Space Sciences (test code 219), or Physics (test code 220). Students seeking

the Foundational-Level General Science Credential take only Subtest I.

EDUCATION AND CALIFORNIA TEACHER CREDENTIAL PROGRAM M.A.

Introduction

The master of arts (M.A.) in education and California teaching credential program prepares prospective teachers to work with California's culturally and linguistically diverse student population. Students in this program earn a master's degree and are eligible to apply for a Preliminary California Credential upon completing a 12-month, five-quarter program comprised of two summers and one academic year. Graduates of the program are prepared to teach English language learners enrolled in K–12 public schools. The program also offers the Bilingual Authorization (in Spanish) for primary language instruction or dual language immersion instruction in a K–12 setting.

Please note that we do not offer a stand-alone Master of Arts in Education nor a stand-alone credential program. Additionally, holders of a previously issued California or out-of-state credential are not eligible for admission to the program.

Students who complete the program are eligible to apply for a California Preliminary Multiple Subject Teaching Credential or a California Preliminary Single Subject Teaching Credential. The Multiple Subject Teaching Credential authorizes the holder to teach in a K–12, self-contained public school classroom, where all subjects are taught by the same teacher. The Single Subject Teaching Credential authorizes the holder to teach in his/her credential subject area in a 6-12 departmentalized classroom setting within a public school system.

The UCSC Single Subject Teacher-Credential Program offers the following subject areas: mathematics, English, social science, and science. Programs of study are subject to change.

Because program requirements are authorized by statutes and regulated by a state entity, the California Commission on Teacher Credentialing program requirements must be responsive to new legislation and regulatory policies. Admission requirements and programs of study referred to are subject to change to comply with regulatory mandates.

Prerequisite Admission Requirements

All candidates for the M.A./Credential program must have preparation in the following areas:

A course, or equivalent experience, that addresses cultural and linguistic diversity. The following UC Santa Cruz undergraduate education courses are examples of courses that meet this requirement: EDUC 128, Immigrants and Education; EDUC 141, Bilingualism and

Schooling; EDUC 164, Urban Education; EDUC 181, Race, Class, and Culture in Education. Other courses offered outside the Education Department may be acceptable however, outside coursework cannot be preapproved by the department. When applying to the program note your outside coursework in your statement of purpose along with an explanation as to how your coursework addresses cultural and linguistic diversity.

A documented field experience with children or youth in an educational setting at the general age level which the candidate aspires to teach. Experiences such as directed observation, substitute teaching, school tutoring, work in after-school programs, camp counseling, instructional aide, or the equivalent are acceptable experiences. When applying to the program, please describe your field experience in the designated area of the application titled Statement of Purpose.

Application Selection Criteria

Admission to the program is competitive. Candidates for admission are selected, in part, on the following criteria:

Academic Record

College coursework is evaluated with attention to content and grades. The appropriateness of courses taken for the credential sought is also taken into consideration. For the multiple subject credential, students should have an extensive breadth of courses in the core subject areas taught in elementary school—mathematics, science, social science, and English. For the single subject credential, students should have an extensive body of coursework in the content area.

Statement of Purpose, Writing Sample, Letters of Recommendation, Personal History, and Résumé

Information provided in these documents is used in the selection of candidates. All documents must be submitted by the application deadline.

Statement of Purpose

The Statement of Purpose should discuss the following:

- An explanation of why you want to become a teacher
- How your experience has contributed to your motivation and potential to be an educational leader
- A description of your experiences related to youth, cultural and linguistic diversity, and community involvement

Writing Sample

- A sample of your writing (no more than 10 double-spaced pages)
- A research-based paper is preferred, for example, a paper written on an educational topic or a paper written in your content area

- Alternatively, applicants may choose to write a brief piece specifically for this application

Letters of Recommendation

- Three letters of recommendation are required
- Two letters should be submitted by university faculty who can address the applicant's academic merit and subject area expertise, and at least one letter submitted by someone in the field who has observed the applicant's work with children or youth in the applicable general age-group for the credential you are seeking through the UCSC Credential Program
- It is recommended that these letters are current and address your qualifications in the following areas:

Academic performance and subject-area expertise

Field work with youth

Experience in culturally and linguistically diverse settings and with student populations who have traditionally been underserved in schools and classrooms.

Personal History

- Write a statement (approximately two to five pages) explaining how your personal history has influenced your decision to apply to this graduate program.

Résumé

- A résumé that includes an employment history; any relevant volunteer or community work, especially in schools and/or with children; and experiences in multicultural and multilingual settings
- Include information on languages (other than English) in which you have competence.

Bilingual Authorization Essay (Bilingual Authorization applicants only)

- Candidates must submit an essay in Spanish as described in the online application.

Admission Requirements

Testing

All required examinations must be met by the stated deadlines.

California Basic Skills Requirement

All admitted applicants must verify completion of the California Basic Skills Requirement by meeting one of the options A through F below. The deadline to complete this requirement: June 10 of each year (prior to official enrollment in the program). However, it is highly recommended that documentation of completion be submitted with the application. Exam registration confirmations, and/or exam score reports, or verification of meeting an alternate option for the Basic Skills

Requirement must be submitted at the time of application via the online application.

- A. The California Basic Skills Test (CBEST).
- B. The California Subject Examinations for Teachers (CSET): Multiple Subjects Subtests I-III plus the CSET: Writing Skills subtest #142 (**passing these tests also meets the Subject Matter Competency requirement for Multiple Subject candidates; see below**).
- C. CSU EAP ('Ready' in English and Math) or CSU Placement Exams (English Placement Test (EPT) and Entry Level Math (ELM)).
- D. SAT (Math 550, English Critical Thinking 500).
- E. ACT (Math 23, English 22).
- F. AP English (3 or higher) and AP Calculus or AP Statistics (3 or higher).

For more information on these additional options, see California Commission on Teaching Credentialing Basic Skills Requirements.

Subject-Matter Competence

California state law mandates that all teachers provide evidence of their subject-matter knowledge. Exam registration confirmations, exam score reports, or documentation of an approved waiver program must be submitted on the online application. Deadline to complete this requirement is June 10 of each year (prior to official enrollment in the program). However, it is highly recommended that documentation of meeting the subject matter requirement be submitted with the application. **Please note that admission priority may be given to applicants who provide documentation at the time of application.**

Multiple Subject Applicants

Individuals can verify subject-matter competence by passing all required subtests of the California Subject Examinations for Teachers (CSET). Passing exam scores are valid for 10 years.

The CSET Multiple Subjects exams are comprised of three required subtests. Admitted MA/Credential applicants are required to submit passing test scores for the following:

- CSET: Multiple Subjects - Subtest I (test code 101)
- CSET: Multiple Subjects - Subtest II (test code 214)
- CSET: Multiple Subjects - Subtest III (test code 103)

Additionally, Multiple Subject applicants may satisfy Subject Matter Competency via a CTC-Approved Subject Matter Waiver Program.

The deadline to submit evidence of satisfying Subject Matter Competency Requirement is June 10. However, it is **highly recommended** that documentation of satisfying the Subject Matter Competency Requirement be submitted at the time of application.

Single Subject Applicants

Individuals may verify subject-matter competence by passing all required subtests of the California Subject Examinations for Teachers (CSET) by content area. Passing exam scores are valid for 10 years.

Admitted MA/Credential applicants are required to submit passing test scores for the following:

Single Subject Area	Credential Type	CSET Subtests Required (test code)
English	English	English Subtest I (105) English Subtest II(106)
		English Subtest III (107) English Subtest IV (108)
Mathematics	Mathematics	Mathematics Subtest I (211) Mathematics Subtest II (212) Mathematics Subtest III (213)
	Foundational-Level Mathematics	Mathematics Subtest I (211) Mathematics Subtest II (212)
Science	Science: Life Science	Science Subtest I (215) Science Subtest II (217)
	Science: Chemistry	Science Subtest I (215) Science Subtest II (218)
	Science: Earth and Space Sciences	Science Subtest I (215) Science Subtest II (219)
	Science: Physics	Science Subtest I (215) Science Subtest II (220)
	Science: Foundational-Level	Science Subtest I (215)
Social Science	Social Science	Social Science Subtest I (114) Social Science Subtest II (115) Social Science Subtest III (116)

Additionally, Single Subject applicants may satisfy Subject Matter Competency via a CTC-Approved Subject Matter Waiver Program.

Certificate of Clearance

In accordance with Education Code Section 44320(b), each credential candidate for an initial credential, prior to admission to any credential program, must obtain a Certificate of Clearance from the California Commission on Teacher Credentialing (CTC). This certificate is a document issued by the commission to an individual who has completed the commission's fingerprint character and identification process. Please note that the CTC requires either a United States-issued Social Security Number (SSN) or Individual Tax Identification Number (ITIN) to apply for a Certificate of Clearance. The IRS issues ITINs regardless of immigration status, primarily for the purpose of federal tax reporting. Detailed instructions for obtaining a Certificate of Clearance may be found [here](#).

A Certificate of Clearance must be submitted directly to the UCSC Online Application. Please upload a copy of your valid Certificate of Clearance or Emergency 30-Day Substitute Teaching Permit into the online application.

- To comply with this regulation the UCSC Education Department must have on file a copy of the Certificate of Clearance before allowing a person to begin public school fieldwork or student teaching.
- If you hold a valid (non-expired) Emergency 30-Day Substitute Teaching Permit, you are not required to apply for another Certificate of Clearance. Please upload a copy (pdfs are accepted) of your valid permit.
- Out-of-state/international applicants must contact the UCSC Education Department for further instructions: edma@ucsc.edu

NOTE: A U.S. Government-issued social security number or ITIN is required to apply for a Certificate of Clearance and the fingerprinting process.

Applicants should be aware that a criminal conviction on their record may preclude them from obtaining a Certificate of Clearance.

Bilingual Authorization Candidates

CSET—Spanish Language and Culture of Emphasis Requirements

- The CSET LOTE (Spanish) Subtest III (CSET test code 147) and CSET LOTE (Spanish) Subtest V (CSET test code 258) (Culture of Emphasis) are required. Admitted applicants must submit verification of having passed the examination **prior** to completing the final quarter of the M.A./Credential program.
- Additional testing information can be found at the CSET Registration website.

Three-page essay in Spanish

Bilingual Program applicants will be required to submit a three-page essay in Spanish with their application to the M.A./Credential Program. The essay should address topical questions listed on the Education M.A. Supplemental Application contained within the online UCSC Graduate School Application.

For further Information

Please contact the department by email to education@ucsc.edu, or view the Education Department's home page where potential applicants can obtain full details about the programs.

Requirements

Course Requirements

Capstone Requirements

Students will complete a capstone portfolio, which includes a teaching performance assessment and reflective papers. Prompts for these assignments may vary from year to year as they reflect the most current California state credentialing requirements.

Multiple Subject Course Requirements

Take all of the following:

EDUC 200	Beginning Student Teaching	5
EDUC 201	Intermediate Student Teaching	5
EDUC 202A	Advanced Student Teaching	5
EDUC 202B	Advanced Student Teaching	5
EDUC 202C	Advanced Student Teaching	5
EDUC 203	Teaching English Language Development: Foundations, Approaches, and Strategies	5
EDUC 205	Teaching, Learning, and Schooling in a Diverse Society	5
EDUC 207	Social Foundations of Education	5
EDUC 208	Portfolio Development	2
EDUC 210	Health, Safety, and Community	2
EDUC 211	Teaching Special Populations in the General Education Classroom	2
EDUC 213	Child and Adolescent Development for Educators	2
EDUC 214	Contemporary Issues in Education	2
EDUC 217	Topics in Elementary Education: Physical Education	2
EDUC 218	Topics in Elementary Education: Visual Arts	2

EDUC 219	Topics in Elementary Education: Performing Arts	2
EDUC 220	Reading and Language Arts for Elementary Classrooms	5
EDUC 221	Science Learning and Teaching in Elementary Classrooms	5
EDUC 222	Mathematics Learning and Teaching in Elementary Classrooms	5

EDUC 212A, EDUC 212B, EDUC 212C: Bilingual Authorization students only

Single Subject Course Requirements

Take all of the following:

EDUC 200	Beginning Student Teaching	5
EDUC 201	Intermediate Student Teaching	5
EDUC 201A	Intermediate Student Teaching: Single Subject	5
EDUC 202A	Advanced Student Teaching	5
EDUC 202B	Advanced Student Teaching	5
EDUC 202C	Advanced Student Teaching	5
EDUC 204	Methods of English Language Development: Single Subject	5
EDUC 205	Teaching, Learning, and Schooling in a Diverse Society	5
EDUC 207	Social Foundations of Education	5
EDUC 208	Portfolio Development	2
EDUC 210	Health, Safety, and Community	2
EDUC 211	Teaching Special Populations in the General Education Classroom	2
EDUC 213	Child and Adolescent Development for Educators	2
EDUC 214	Contemporary Issues in Education	2
EDUC 225	Reading Across the Curriculum in Middle School and Secondary	5

EDUC 212A, EDUC 212B, EDUC 212C: Bilingual Authorization students only

Single Subject Credential students enroll in the two methods courses related to their subject area:

EDUC 226	English Teaching: Theory and Curriculum	5
EDUC 227	English Teaching for Secondary Classrooms	5

EDUC 228	Math Education: Research and Practice	5
EDUC 229	Teaching Mathematics in the Secondary Classroom	5
EDUC 230	Science Education: Research and Practice	5
EDUC 231	Teaching Science in the Secondary Classroom	5
EDUC 232	Social Science: Theory and Curriculum	5
EDUC 233	Social Science Teaching for Secondary Classrooms	5

Bilingual Authorization Course Requirements

Take all of the following:

EDUC 212A	Bilingualism and Bilitery: History, Politics, Theory, and Practice	2
EDUC 212B	Bilingualism and Bilitery: Language, Literacy and Content Instruction	2
EDUC 212C	Bilingualism and Bilitery: Community and School Partnerships	2

Other Requirements

Program and State of California Requirements

(Not Required for Initial Admission to the Program)

These requirements may be met prior to or while enrolled in the program, but they must be met to be eligible for a California teaching credential.

U.S. Constitution Requirement

A course on the U.S. Constitution (or completion of an examination offered by the Education Department to enrolled students) is required. UCSC-approved courses that meet this requirement are POLI 20, American Politics; POLI 111A/LGST 111A, Constitutional Law; POLI 120A, Congress, President, and the Court in American Politics; and HIS 10A, United States History to 1877.

Admitted applicants must submit verification of completing the U.S. Constitution Requirement prior to completing the final quarter of the M.A./Credential program.

Preliminary Technology (Level 1) Requirement

All candidates for their credential must fulfill the requirements for Level 1 technology skills which includes general and specialized skills in the use of computers in educational settings.

UC Santa Cruz students meet this requirement in one of two ways:

- Option 1: Pass the CSET Preliminary Educational Technology Subsets I & II, (CSET test codes 133

& 134). For more information, see the Technology Subsets I & II information on the CSET website.

- Option 2: Pass the UCSC approved course offered through the UCSC Extension Program, XSC209, Technology in Schools, Introduction (online format).

Admitted applicants must submit verification of completing the Level 1 Technology Requirement **prior** to completing the final quarter of the M.A./Credential program.

Reading Instruction Competence Assessment (RICA)

Multiple Subjects candidates are required—prior to completion of the program and in order to be recommended for a preliminary credential—to pass the RICA examination. The RICA measures the knowledge, skills, and abilities essential to offer effective reading instruction to K–12 students. For more information on the RICA examination, see the RICA examination information on the CSET website.

Candidates should not take this examination prior to completing EDUC 220.

Admitted applicants must submit verification of having passed the RICA **prior** to completing the final quarter of the M.A./Credential program.

CPR

A certified cardiopulmonary resuscitation (CPR) course (infant, child, and adult) must be completed and valid upon application for the credential.

Admitted applicants must submit verification of obtaining certification in Infant/Child/Adult CPR prior to completing the final quarter of the M.A./Credential program.

Tuberculosis (TB) Test

All K-12 schools require anyone working with children to be tested for TB. You can get tested through the UCSC Student Health Center (831-459-2500 to make an appointment) or your private doctor. A copy of your official results must be turned into the Education Department before the end of the first summer quarter.

Student Teaching

The successful development of teaching skills in the classrooms is the culmination of a teacher education program. Therefore, candidates must demonstrate, by the end of their program, teaching competence in the classroom. Credentialed public school teachers are responsible for the nurturing of children and youth. Therefore, teaching credential candidates must consistently display conduct befitting the profession. To this end, the candidate must be able to cope with the demands and responsibilities of teaching as outlined below:

- Meet university and program requirements and deadlines (including school expectations during field experiences).
- Plan ahead to anticipate the transportation needs and potential demands of student teaching.
- Be able to adapt to institutional and/or professional expectations and policies.
- Relate appropriately to children, parents, and school staff.
- Demonstrate sensitivity to the social, cultural, and economic context of the school environment.
- Adhere to school expectations for dress, appearance, and personal hygiene.

Candidates whose professional behavior does not meet these minimal standards may be recommended for dismissal from the program.

Beginning Student Teaching, which begins in August during the Summer Bridge between the university summer and fall quarters, constitutes the first classroom observation experience for students in the program, and continues through most of fall quarter. Student teachers are in their classroom placements from 10–14 hours a week depending on the school site schedule. To enroll in this course, students must have a Certificate of Clearance issued and on file with the California Commission on Teacher Credentialing.

Intermediate and advanced student teaching begins late fall and continues through winter and spring, until the end of the academic year in June. Student teachers are placed with cooperating teachers in local schools throughout Santa Cruz County and beyond. Students are in the classroom placements 14 or more hours a week in winter quarter leading toward full time in the classroom by spring quarter. They gradually assume responsibility for preparation, instruction, and evaluation of the class during this period. Supervisors of teacher education give ongoing and frequent support to students in their classroom placements and in seminars at UCSC. Multiple Subject candidates obtain classroom experience in both primary and intermediate grades. Single Subject candidates obtain classroom experience in middle school/junior high and high school.

Admission to EDUC 201 and EDUC 201A, Intermediate Student Teaching, and EDUC 202A-EDUC 202B-EDUC 202C, Advanced Student Teaching, is based on an assessment of academic performance, experience, leadership, and initiative shown in public school placements and required courses taken earlier in the program. Please note that passing the CSET examination is a requirement for Advanced Student Teaching. Students who have not completed the CSET requirement prior to winter quarter will be asked to take a leave of absence from the program.

[Optional Catchall]

Applying for Graduation

EDUCATION PH.D.

Introduction

The goal of the Ph.D. in education is to support graduate students in becoming creative scholars who engage in research focused on the educational needs of students from linguistic and cultural groups that have historically not fared well in our nation's public schools. To achieve this goal, this program provides students with grounding in the varieties of interdisciplinary theorizing, research methods, and applications needed to advance the study of learning and teaching for diverse student populations. The courses and research experiences are closely related to practice in K-12 classrooms and informal settings. Students in this interdisciplinary program apply tools and perspectives from education, anthropology, linguistics, philosophy, psychology, sociology, cognitive science, and cultural historical activity theory. The program integrates theory and practice to examine learning and teaching within the multiple contexts of classroom, school, family, and community. Graduates of this program will be qualified to teach and to conduct the kinds of educational research demanded by tenure-track positions in research and regional universities. Graduates may also work in non-university based institutions that focus on teacher professional development, curriculum development, and related areas of educational research and development.

Together with his or her faculty adviser, each student develops an integrated program of study that includes advanced coursework, seminars, and electives. Students learn through an apprenticeship model in which they develop expertise through active participation in research. Courses may be taken in other departments, when appropriate.

Ph.D. Admissions Guidelines

The minimum GPA established by the University of California for admission to graduate school is 3.0. In general, the Ph.D. in education program looks for potential excellence in graduate students, whether this manifests itself in a high GPA, strong letters of recommendation, or a high Graduate Record Examination (GRE) score (optional for the 2020-21 admissions cycle) or a strong Statement of Purpose. Applicants will be evaluated on their individual merits and also with regard to how well their proposed doctoral research can be supported by the existing resources of the program.

Admission Requirements

- Bachelor's degree, or its equivalent, from an accepted university prior to the quarter for which admission is sought
- 3.0 GPA or above

- Official GRE scores taken within the last five years are optional for the 2020-21 admission cycle
- Experience working with culturally and linguistically diverse students and/or communities
- Statement of Purpose
- Personal History Statement
- A writing sample, preferably in education or a related field. The sample can be a term paper, a field report, a research proposal, or an essay written especially for the application
- Official transcripts from all colleges/universities attended after high school
- Three current recommendation letters specifying potential for academic or scholarly work
- Current résumé
- Application fee
- International applicants must take the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) test. A minimum score of 550 on the TOEFL (paper), 220 on the TOEFL (computer), or 83 on the Internet-based test is required for admission. For those choosing to take the IELTS, a minimum overall score of 7 is required. The program follows Graduate Division guidelines when considering TOEFL waivers.

Prior to completing your application, we highly recommend a personal (in person or on the phone) interview with at least one of our faculty members. Please contact an education faculty member whose research interest is similar to your own (for descriptions of faculty research, please visit the Education Department website).

Financial Support

Financial support for students includes a variety of fellowships, research assistantships, and teaching assistantships in the Education Department. Students may participate in research projects under the auspices of several interdisciplinary research centers and research projects. In the past, these have included the Chicano/Latino Research Center (CLRC), the Vocabulary Innovations in Education (VINE) project, The Teachers With Computers: Ward Annotations for Vocabulary Education (tecWAVE) project, English Language and Literacy Integration in Subject Areas (ELLISA), Effective Science Teaching for English Language Learners (ESTELL) project, The Center for Collaborative Research for an Equitable California (CCREC), and the Center for Educational Research in the Interest of Underserved Students (CERIUS). Recently, students have participated in research projects with the Center for Research on Equity and Collaborative Evaluation (CRECE) and the History & Civics Project (H&CP).

For Further Information

Contact the doctoral student adviser by sending an email to edphd@ucsc.edu or view the Education Department's home page where potential applicants can obtain full details about the programs.

Advancement to Candidacy

To achieve Ph.D. candidacy, students are expected to pass an annual review of their written work, maintain satisfactory academic progress, complete all required courses, attend department colloquia, complete a second-year research project, complete a TAship or teaching internship, pass a qualifying examination, and meet the specific requirements of the Division of Graduate Studies.

Course Requirements

During the first two years of study, all students are expected to enroll in a set of required courses, including foundational courses, methodology courses, and elective courses. The student and his/her faculty adviser will determine the overall program of study, depending on the student's preparation, interests, and plans. The program encourages interdisciplinary study.

Course Requirements and Sequencing

The following courses constitute the minimum requirements: four foundational courses, five research methods courses, four elective courses, one additional course in any category, a second-year project independent study, a second-year doctoral proseminar sequence, and a research apprenticeship. Incoming students consult with their faculty advisers about the current course offerings to determine the order in which they will complete required courses. Students are encouraged to take courses beyond the minimum required; in consultation with their advisers, students will determine the full set of research methods and elective courses they will complete based on their intellectual interests and professional goals. All required courses must be completed prior to advancement to candidacy.

The department typically offers approximately eight doctoral courses during each year. The Education Department annually admits 4-6 Ph.D. students, leaving room for doctoral students from other departments to take courses in education.

Courses required before advancing to candidacy:

EDUC 235	Introduction to Educational Inquiry	5
EDUC 236	Quantitative Research Methods	5
EDUC 237	Qualitative Research Methods	5
EDUC 250	Teaching and Teachers	5
EDUC 255	Intermediate Quantitative Methods	5

EDUC 256	Intermediate Qualitative Analysis	5
EDUC 261	Thinking and Learning	5
EDUC 262	Social and Cultural Context of Education	5
EDUC 272	Language in Education and Society	5

And four electives, two of which must be from the list below:

Choose two of the following:

EDUC 263	Educational Reform	5
EDUC 264	Research on Teacher Development and Teacher Education	5
EDUC 268	Schools, Communities, and Families	5
EDUC 280	Language and Literacy Across Disciplines	5
EDUC 286	Research in STEM Education	5
EDUC 295	Critical Perspectives on Education	5

Plus one additional course from any category

Plus the following courses

A total of 16 credits from the following:

Both of the following courses

EDUC 293B	Research Apprenticeship	5
EDUC 294	Second-Year Research Project	5

EDUC 293A is a 2-credit course and can fulfill the requirement for EDUC 293B if it is taken three times.

Plus 6 credits from the following Second-Year Doctoral Proseminar series

EDUC 277A	Second-year Doctoral Proseminar	2
EDUC 277B	Second-year Doctoral Proseminar	2
EDUC 277C	Second-year Doctoral Proseminar	2

EDUC 277A, EDUC 277B, EDUC 277C must each be taken to satisfy the requirement.

The following may also be counted toward meeting elective requirements:

- M.A. course in education with additional readings and assignments. (One maximum to count toward the four electives and/or the additional course.)
- Independent Study. (One maximum to count toward the four electives and/or the additional course.)
- Undergraduate upper-division course with additional readings and assignments. (One

maximum to count toward the four electives and/or additional course.)

Other Requirements

Students are required to attend the Education Department's colloquium series during their first and second years in the program.

Students are required to complete a second-year project paper (the same project to be approved for the en route M.A.). The final version must be approved by two faculty readers by the end of spring quarter of their second year.

Foreign Language Requirements

Teaching Requirement

The education Ph.D. program emphasizes teaching experience, and all students are required to complete one TAship or teaching internship in education prior to advancement to candidacy.

Pre-Qualifying Requirements

Students are required to attend the Education Department's colloquium series during their first and second years in the program.

Students are required to complete a second-year project paper (the same project to be approved for the en route M.A.). The final version must be approved by two faculty readers by the end of spring quarter of their second year.

Qualifying Examination

The qualifying examination is intended to assess a student's depth and breadth of knowledge in their areas of concentration and his/her competence to do extended dissertation-level research. Normally taken near the end of the third year of enrollment, the examination consists of both written and oral components. For the written portion, the student prepares three papers, two of which advance a position based on a review of related research, theoretical framework, or research design/methods; the third is a dissertation prospectus. The student presents and defends their work at the oral examination.

Post-Qualifying Requirements

To achieve Ph.D. candidacy, students are expected to pass an annual review of their written work, maintain satisfactory academic progress, complete all required courses, attend department colloquia, complete a second-year research project, complete a TAship or teaching internship, pass a qualifying examination (QE), and meet the specific requirements of the Division of Graduate Studies.

Advancement to Candidacy

To achieve Ph.D. candidacy, students are expected to pass an annual review of their written work, maintain satisfactory academic progress, complete all required courses, attend department colloquia, complete a second-year research project, complete a TAship or teaching

internship, pass a qualifying examination, and meet the specific requirements of the Division of Graduate Studies.

Requirements for the M.A. Degree

Although applications for a master's degree independent of the Ph.D. program are not accepted, students in the Ph.D. program may obtain a M.A. degree after successfully completing a minimum of six quarters residency, a total of 81 course credits (including four foundational courses, five research methods courses, at least four elective courses, a minimum of two from the Education Electives list, one more course from any category, a 5-credit course for the second-year research project, a three-quarter second-year proseminar sequence), and an approved and completed second-year research project. Students seeking an M.A. degree must adhere to the guidelines set forth by the Graduate Division.

Dissertation

Dissertation

A dissertation based on substantive original research is required.

Dissertation Defense

After the dissertation has been completed, students must defend the dissertation in an oral examination.

Academic Progress

Applying for Graduation

[Optional Catchall]

EDUCATION DESIGNATED EMPHASIS

Introduction

The Designated Emphasis in Education enables doctoral students in other departments to pursue interests in education and obtain formal certification of competence in the field of education. Most Education Department Ph.D. courses are offered every other year; the Education Department welcomes D.E. students from other departments to take courses in education. Students should work closely with their education adviser to develop a plan for taking the coursework in a timely fashion.

Education is an institutional field in which scholars from a wide variety of disciplines—including sociology, psychology, politics, economics, mathematics and science—have scholarly interests. A Designated Emphasis in Education enables graduate students from other departments to ground their work in theory and research on important issues in education.

Requirements

The requirements for obtaining a designated emphasis in education are the following:

Committee Composition and Departmental Approvals

Obtain a designated faculty advisor from the faculty in the Education Department. This faculty advisor will be in addition to the faculty advisor from the student's home department. The education faculty advisor must serve on the student's qualifying examination committee and, as appropriate, may also serve on the student's dissertation committee.

Course Requirements

Complete at least five EDUC 5-credit doctoral courses for a total of 25 credits, and 25 credits, from the following list, with no more than two in research methods. Any requests for substitutions must be approved by the Education Department graduate director.

Choose five courses from the following options:

Choose five courses from the following options:

EDUC 235	Introduction to Educational Inquiry	5
EDUC 236	Quantitative Research Methods	5
EDUC 237	Qualitative Research Methods	5
EDUC 250	Teaching and Teachers	5
EDUC 255	Intermediate Quantitative Methods	5
EDUC 256	Intermediate Qualitative Analysis	5
EDUC 261	Thinking and Learning	5
EDUC 262	Social and Cultural Context of Education	5
EDUC 263	Educational Reform	5
EDUC 264	Research on Teacher Development and Teacher Education	5
EDUC 268	Schools, Communities, and Families	5
EDUC 272	Language in Education and Society	5
EDUC 280	Language and Literacy Across Disciplines	5
EDUC 286	Research in STEM Education	5
EDUC 295	Critical Perspectives on Education	5

With no more than two courses from the following group:

EDUC 235	Introduction to Educational Inquiry	5
EDUC 236	Quantitative Research Methods	5
EDUC 237	Qualitative Research Methods	5

EDUC 255	Intermediate Quantitative Methods	5
EDUC 256	Intermediate Qualitative Analysis	5

And the remainder from this group:

EDUC 250	Teaching and Teachers	5
EDUC 261	Thinking and Learning	5
EDUC 262	Social and Cultural Context of Education	5
EDUC 263	Educational Reform	5
EDUC 264	Research on Teacher Development and Teacher Education	5
EDUC 268	Schools, Communities, and Families	5
EDUC 272	Language in Education and Society	5
EDUC 280	Language and Literacy Across Disciplines	5
EDUC 285	Culture and Learning	5
EDUC 295	Critical Perspectives on Education	5

Writing, Research and/or Teaching Requirements

Prepare a significant piece of writing in some area of education. This writing may take the form of a substantial position paper (QE paper) grounded in the literature of educational research, as determined by the graduate advisor in education. In the event the education faculty advisor serves on the dissertation committee then the writing may instead be a dissertation chapter.

Academic Progress**For Further Information**

Contact the doctoral student advisor by sending an email to edphd@ucsc.edu or view the Education Department's home page where potential applicants can obtain full details about the programs.

[Optional Catchall]**Environmental Studies**

405 Interdisciplinary Sciences Building
 (831) 459-2634--Main Office
 (831) 459-5004--Undergraduate Major and Requirement Inquiries
 (831) 459-4136--Doctoral Program Inquiries
<https://envs.ucsc.edu>

PROGRAMS OFFERED

- Environmental Studies B.A. (p. 621)
- Agroecology B.A. (p. 637)
- Environmental Studies/Biology B.A. (p. 642)
- Environmental Studies/Earth Sciences B.A. (p. 642)
- Environmental Studies/Economics B.A. (p. 654)

Environmental Studies Ph.D. (p. 660)

Environmental Studies Designated Emphasis (D.E.) (p. 661)

Environmental Studies is a field of study that views the Earth and our place in it, as a set of complex, interacting socio-ecological systems. At UC Santa Cruz, we use an interdisciplinary approach to study the social, cultural, and scientific relationships with the environment. Courses in environmental studies provide training not only in the physical and social sciences, but also in writing, critical thinking, quantitative analysis, project and team management, and more. Environmental studies alumni are making a difference in conservation organizations, habitat restoration, sustainable agriculture, environmental mediation, biodiversity research, and many other areas.

Undergraduate Program

The environmental studies major prepares students for meaningful lifetime engagement with the environmental challenges that are facing society. UCSC environmental studies graduates hold leadership positions as legislative and policy analysts, environmental lawyers, environmental managers, city and state planners, educators, restoration ecologists, organic farmers and agroecology specialists, conservation biologists, environmental engineers, museum curators, business consultants, and political advocates. In addition, many graduates go on to obtain professional, master's, or doctoral degrees at the nation's finest institutions.

Students pursue an interdisciplinary curriculum that combines coursework in the natural and social sciences. Introductory courses cover the ecological, political, and economic aspects of historic, current and future environmental issues. The core course, Environmental Studies 100/L, Ecology and Society builds on the skills acquired in the lower-division classes, and encourages students to apply ecological, economic, and political skills toward environmental and ecosystem management. The remaining upper-division elective courses further emphasize the integration of ecological knowledge with an understanding of social institutions and policies. The program emphasizes active, interdisciplinary learning with the overall objective of instilling the necessary skills to conserve biodiversity and integrate the principles of sustainability with respect to management of complex environmental systems. Faculty work on these issues at local, regional, and global levels, providing a unique, proactive, and progressive academic environment for students wishing to pursue a degree program within the Environmental Studies Department.

As a complement to classroom instruction and research, many courses have field components. The Environmental Studies Internship Program helps qualified students find placements with government and educational agencies, community organizations, and private firms. Furthermore, faculty-directed, independent, or field-oriented research courses allow environmental studies students the opportunity to learn more about their specific academic

career or personal interests, often while earning academic credit.

In addition to the single environmental studies major, students can also choose to pursue the agroecology major. The major will provide students with a depth of expertise in interdisciplinary knowledge and skills related to agroecology and sustainable food systems. UCSC students pursuing the B.A. in agroecology will gain knowledge and skills in multiple disciplines and an increased understanding of complex agricultural systems.

Students may also choose to pursue one of three combined majors with biology, earth sciences, or economics. The combined major curricula offer the unique integration of the underlying concepts of environmental studies with a focus on the application of these concepts in a closely related field (or vice versa).

The general environmental studies B.A. major offers three concentrations in addition to the major without a concentration. Below are the concentrations offered in the environmental studies B.A. major.

Geographic Information Systems Concentration

Geographic Information Systems (GIS) is an interdisciplinary field that links ecology, geography, and society to evaluate and facilitate environmental planning, policy, management and conservation. Within environmental studies, GIS addresses complex and interconnected social and ecological problems and fosters more sustainable environmental futures by supporting the visualization of geographical distribution of environmental problems and solutions. GIS is also an information technology field that acquires, manages, interprets, integrates, displays, analyzes, or otherwise uses socio-economic and environmental data focusing on geographic, temporal, and spatial contexts. Students in the GIS concentration will develop a strong foundation in environmental problem solving that is linked to geospatial data acquisition and management, computer-based GIS technologies, and advanced geospatial analysis. GIS is a key emerging industry in the U.S. today and job growth is rapidly expanding. GIS specialists work in many areas, including research and analysis in resource and environmental management, biology, sociology, marine sciences, commercial business and marketing, and urban and regional planning.

The GIS concentration provides students within environmental studies majors with a set of foundational courses in introductory geospatial data management and visualization, information technology and software in GIS, and advanced geospatial analytical approaches for environmental applications. The program learning outcomes and student competencies that are achieved through the concentration include the successful development of basic geospatial technology skills and abilities, advanced geo-spatial data analysis abilities for environmental applications, enhanced understanding of scale, co-production of space, politics and power of

representation, and the preparation of students for entry and mid-level careers as GIS specialists.

Global Environmental Justice Concentration

According to the United States Environmental Protection Agency (EPA), environmental justice is defined as ‘the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.’ Today, environmental justice is a pillar of national environmental policy, with a swathe of laws and legislation that covers a wide range of sectors. It is a growing area in policy, advocacy and scholarship internationally, embracing topics as diverse as indigenous rights, gender equity and climate justice. In recent years, a parallel idea—of human rights and the environment—has emerged in legal and policy contexts. Environmental justice and human rights are thus among the fastest growing subjects in environmental public policy globally.

This concentration provides students within environmental studies majors with special depth of understanding of the issues and approaches central to global environmental justice. The global environmental justice concentration is premised on the assertion that the distribution of environmental problems reflects longstanding, uneven terrains of power and privilege, exploitation, and dispossession. Globalization and the fluidity of corporate capital, commodity chains and community campaigns require approaches that conceptualize the frictions between the local and global, legacies of colonialism, and multiplicity of responses—human and non-human—in the face of oppression, adaptation, and resistance. The inextricable interconnections between ecological and social degradation, and the social implications of efforts to remedy ecological degradation, are an intrinsic and important core of environmental studies.

Conservation Science and Policy Concentration

Effective conservation of biological diversity requires integrating principles of conservation biology and environmental policy. Conservation science is built on a foundation of natural history embedded into a framework of modern ecological theory. Conservation policy reflects social values and provides the economic and legislative tools to achieve desired goals surrounding the conservation of species and ecosystems. The purpose of the conservation science and policy concentration is to provide students within environmental studies majors with the depth and necessary skills in natural history, conservation biology, and environmental policy to effectively engage in this intrinsically interdisciplinary field. Students completing this concentration will be prepared for positions with government agencies and conservation organizations concerned with biodiversity conservation and ecosystem management.

The concentration requires upper-division core courses in both natural and social science aspects of conservation, as well as a field-based course in ecology, natural history, or conservation. The field-based course is important because effective work in the conservation field requires a deep understanding of natural ecosystems. This is best learned through immersive, experiential field courses that develop a natural history-based understanding of ecosystems as well as how to ask and answer critical ecological and conservation questions.

Graduate Program

Environmental Studies Ph.D. Program

Established in 1994, the doctoral program* in the Department of Environmental Studies at UC Santa Cruz emphasizes close faculty-student interactions, department-wide intellectual exchange, and cross-discipline innovation. The goal of our Ph.D. program is to develop exceptional individuals with strong foundations in their own fields, and the ability to work with those in other relevant specialties.

The program draws from two main areas: ecology and social science. These are historically independent fields and UCSC's Environmental Studies program is one of the first to link them.

Graduates of the Environmental Studies Doctoral Program at UC Santa Cruz are expected to be informed in conservation biology, global change ecology, agroecology, environmental policy, and political economy of the environment. Our students have deep intellectual strength in their area of specialty, and make substantial contributions toward the understanding of an environmental problem.

Please contact our Graduate Program coordinator with any questions or inquiries you may have.

Designated Emphasis

The Designated Emphasis is the equivalent of a "minor" for doctoral study. It will provide you with a framework for in-depth study in specialized fields in your area, and an opportunity for recognition of particular scholarly expertise.

Discuss your intention to declare the Environmental Studies Designated Emphasis with your primary advisor and the Graduate Program coordinator, in your primary Ph.D. program.

Please see this page for information about the Designated Emphasis in Environmental Studies.

**Our program is doctoral only, we do not offer a terminal master's degree at our program.*

ENVIRONMENTAL STUDIES

B.A.

Information and Policies

Introduction

The environmental studies major provides an interdisciplinary approach to learning how to move toward a more sustainable future for human and ecological systems. Courses in environmental studies provide training not only in the physical, biological, and social sciences, but also in writing, critical thinking, quantitative analysis, project and team management, and more. Most students extend their learning outside the classroom through the departmental internship program.

The major is available either without a concentration or in conjunction with one of four more specialized concentrations that provide depth in particular areas of expertise. See the Undergraduate Program page for a description of each of the concentrations offered.

Academic Advising for the Program

Advising is one way to make the most of your university experience. The advising system at UC Santa Cruz is amazing, and we encourage you to use it often. Ask questions, seek advice, and make decisions that work best for you.

To receive advising for this major, contact envsadv@ucsc.edu. Additional information for prospective transfer students can be found in the Transfer Information and Policy section.

Getting Started in the Major

Program Learning Outcomes

Students graduating with a B.A. degree in environmental studies will be able to:

- Identify the societal (social, political, economic and ethical) agents and structures that contribute to environmental change. (social science competency)
- Describe the structure and functioning of major physical and ecological components of the earth's systems. (natural science competency)
- Access and analyze a complex literature addressing specific topics in environmental studies, and evaluate the usefulness and limitations of individual sources of information. (analytic thinking)
- Demonstrate effective oral and written communication skills. (communication skills).

Major Qualification Policy and Declaration

Process

Major Qualification

To qualify for the environmental studies major, students must complete the specific courses listed below, or their approved equivalents.

One of the following:

ENVS 23	The Physical and Chemical Environment	5
CHEM 1A	General Chemistry	5

Plus one of the following:

ENVS 24	General Ecology	5
BIOE 20C	Ecology and Evolution	5

Plus all of the following:

STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2
ENVS 25	Environmental Policy and Economics	5

Determining qualification

- Students who complete all the qualification courses with a grade of P, or letter grade of C or better are qualified to declare the major.
- Students who have received one grade of NP, C-, D+, D, D-, or F in one of the qualification courses taken at UC Santa Cruz will only be qualified to declare the major after successfully completing the same or an equivalent course with a grade of P, or letter grade of C or better.
- Students with two or more grades of NP, C-, D+, D, D-, or F in the qualification courses taken at UC Santa Cruz are not qualified to declare the major.
- Students with AP credit (score of 3 or higher) for any of the qualification course(s) are qualified to declare after successfully completing the remaining qualification courses.
- Students must attend an Environmental Studies Department declaration workshop when requesting to declare the major.

Appeal Process

Students who are not qualified to declare the major may appeal this decision by submitting an appeal to qualify for the major within 15 days of the denial of the declaration. Within 15 days of receipt of the appeal, the department will notify the student and college of the decision. If a student has questions about the appeals process, they should contact envsadvi@ucsc.edu.

How to Declare a Major

All students are required to attend one declaration workshop offered during the first three weeks of the quarter they are eligible to declare. Before students attend declaration workshops, they should check to see if they are eligible to declare using the major qualification page. Students wishing to declare within the Environmental Studies Department should visit the Environmental Studies Department website and follow the steps listed in the "how to declare" tab. Degree requirement sheets may be downloaded from the Environmental Studies Undergraduate Program Requirements page.

Transfer Information and Policy

Transfer Admission Screening Policy

Students who apply for transfer admission to the major are required to have taken the equivalents of the following courses with a C grade (2.0) or better by the end of the spring term for students planning to enter in the fall.

One of the following:

ENVS 23 or a general chemistry course

Plus one of the following:

ENVS 24	General Ecology	5
BIOE 20C	Ecology and Evolution	5

Plus one of the following:

AM 3	Precalculus for the Social Sciences	5
AM 11A	Mathematical Methods for Economists I	5
AM 11B	Mathematical Methods for Economists II	5
MATH 3	Precalculus	5
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 22	Introduction to Calculus of Several Variables	5
MATH 23A	Vector Calculus	5

Plus one of the following options:

Either this course:

ENVS 25	Environmental Policy and Economics	5
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Or these courses:

ECON 2 and a course in national or international politics

Or these courses:

ECON 1 and a course in national or international politics

GPA Requirement

To be considered for admission in the environmental studies majors, transfer students must pass the screening policy courses or its equivalents with a C grade (2.0) or better.

Recommended Courses

In addition, the following courses are recommended prior to transfer to ensure timely graduation.

SOCY 1	Introduction to Sociology	5
SOCY 10	Issues and Problems in American Society	5
SOCY 15	World Society	5
ANTH 2	Introduction to Cultural Anthropology	5
PHIL 22	Introduction to Ethical Theory	5
PHIL 24	Introduction to Ethics: Contemporary Moral Issues	5
PHIL 28	Environmental Ethics	5
BME 80G	Bioethics in the 21st Century: Science, Business, and Society	5

General Education Courses (GEs)

Prospective students are also encouraged to complete the Intersegmental General Education Transfer Curriculum (IGETC) or to complete all UC Santa Cruz general education requirements before matriculation.

Getting Started at UCSC as a Transfer Student

Transfer students pursuing environmental studies majors are encouraged to transfer in the fall quarter.

Transfer students should enroll in STAT 7 & STAT 7L during the summer or fall quarter in order to take ENVS 100 & ENVS 100L in winter or spring quarter of their first year. Transfer students who have completed the screening requirements listed above can formally declare their major once STAT 7 and STAT 7L are completed. Transfer students can formally declare their major once qualification courses are successfully completed, following the steps in How to Declare a Major given above.

ENVS 25 and CHEM 1A are usually offered during Summer Session at UC Santa Cruz, and transfer students are encouraged to take these classes if they have not yet completed a substitute requirement or if they want a better understanding of the relevant material. If you are transferring, compare catalog descriptions, consult your current institution's advisor, and refer to the ASSIST website to determine equivalency. Prospective transfer students should review the transfer information.

Students who are proposed in a different major and have advanced standing when they come to UCSC require permission from the department to change into the major. Contact envsadv@ucsc.edu to request permission.

Letter Grade Policy

This program does not have a letter grade policy, except that the comprehensive requirement must be taken for a letter grade.

[Optional Catchall]**Course Substitution Policy**

Single environmental studies students can petition up to two upper-division courses to count toward the single environmental studies major requirements. These two substitutions courses may be the following:

- Pre-approved substitution courses: You may enroll into this list of courses (p. 661) without petition to substitute for up to two ENVS electives.
- By petition: You may petition to substitute courses taken outside of ENVS and/or UC Santa Cruz such as: other institutions, other departments, courses not listed on the pre-approved substitution list, other programs including Educational Abroad Program (EAP), Wildlands Studies, or the Sierra Institute. Please review the petitioning process [here](#).

Double Majors and Major/Minor Combinations Policy**Study Abroad**

Students in environmental studies are encouraged to participate in Study Abroad programs and other off-campus programs. Students who are interested in these programs shall note the following policies:

- Students who are planning to take part in Study Abroad programs must be declared in their major prior to studying abroad.
- Students must have their courses they plan to take abroad reviewed and approved by Environmental Studies Advising.
- Single environmental studies majors may petition to substitute up to two courses taken abroad to count toward the environmental studies upper-division electives. Combined environmental studies majors cannot petition for substitution. Please review the petitioning process [here](#) prior to your EAP program.
- For more information on EAP, please visit the UC Education Abroad Program website.

Honors

Departmental Honors. Students must have a 3.5 grade point average (GPA) in all courses used to satisfy the

environmental studies upper-division requirements. To be considered for departmental honors, students are limited to no more than one grade of P in those upper-division courses.

Senior Comprehensive Honors. Only applicable to a senior thesis, senior internship, or individual work in a senior seminar. Honors must be awarded by the student's faculty sponsor, and a second faculty member (chosen by the student's faculty advisor) must concur.

Highest Departmental Honors. Students must have a 3.75 grade point average (GPA) in all courses used to satisfy the environmental studies upper-division requirements and must also receive senior comprehensive honors (see above). To be considered for highest departmental honors, students are limited to no more than one grade of P in those upper-division courses.

[Optional Catchall]

Major Without a Concentration

Course Requirements

Continuing students must complete all lower-division course requirements before taking ENVS 100 and ENVS 100L.

Lower-Division Courses

One of the following courses

ENVS 23	The Physical and Chemical Environment	5
CHEM 1A	General Chemistry	5

Plus one of the following courses

ENVS 24	General Ecology	5
BIOE 20C	Ecology and Evolution	5

Plus the following course:

ENVS 25	Environmental Policy and Economics	5
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Plus one of the following options:

One of the following courses

AM 3	Precalculus for the Social Sciences	5
AM 11A	Mathematical Methods for Economists I	5
AM 11B	Mathematical Methods for Economists II	5
MATH 3	Precalculus	5
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 22	Introduction to Calculus of Several Variables	5
MATH 23A	Vector Calculus	5

Or take a placement exam:

Take the Math Placement Exam (MPE) with a score of 300 or higher or take the AP Calculus exam with a score of 3 or higher

Plus all of the following

STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

Plus one introductory course in sociology, cultural anthropology, or ethics

Choose one of the following:

ANTH 2	Introduction to Cultural Anthropology	5
BME 80G	Bioethics in the 21st Century: Science, Business, and Society	5
PHIL 22	Introduction to Ethical Theory	5
PHIL 24	Introduction to Ethics: Contemporary Moral Issues	5
PHIL 28	Environmental Ethics	5
SOCY 1	Introduction to Sociology	5
SOCY 10	Issues and Problems in American Society	5
SOCY 15	World Society	5

Upper-Division Courses

Students are required to complete the following upper-division courses:

ENVS 100	Ecology and Society	3
ENVS 100L	Ecology and Society Writing Laboratory	5

Environmental studies core course is offered twice yearly during the winter and spring quarters.

Electives

A total of seven upper-division electives (environmental studies courses numbered ENVS 101 through ENVS 179) must be completed. One course must be from the list below of upper-division courses based on natural sciences, and one course must be from the list below of upper-division courses based on the social sciences.

A list of all courses offered by the Environmental Studies Department is available in the courses section of the catalog (p. **Error! Bookmark not defined.**). A list of which upper-division courses offered in the current year by the Environmental Studies Department are based in the natural sciences and which in the social sciences is available on the department website.

Lecture/lab combinations count as one course.

Courses based on natural sciences

ENVS 104A	Introduction to Environmental Field Methods	5
ENVS 104L	Field Methods Laboratory	2
ENVS 106A	Natural History of Birds	5
ENVS 107A	Natural History Field Quarter	5
ENVS 107B	Natural History Field Quarter	5
ENVS 107C	Natural History Field Quarter	5
ENVS 108	General Entomology	5
ENVS 108L	General Entomology Laboratory	3
BIOE 151A	Ecology and Conservation in Practice Supercourse: Ecological Field Methods	5
BIOE 151B	Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory	5
BIOE 151C	Ecology and Conservation in Practice Supercourse: Functions and Processes of Terrestrial Ecosystems	5
BIOE 151D	Ecology and Conservation in Practice Supercourse: Conservation in Practice	4
ENVS 120	Conservation Biology	5
ENVS 121	Landscape Ecology	5
ENVS 122	Tropical Ecology and Conservation	5
ENVS 123	Animal Ecology and Conservation	5
BIOE 125	Ecosystems of California	5
ENVS 129	Integrated Pest Management	5
ENVS 129L	Integrated Pest Management Laboratory	2
ENVS 130A	Agroecology and Sustainable Agriculture	5
ENVS 130L	Agroecology and Sustainable Agriculture Laboratory	2
ENVS 130C	Field Experiences in Agroecology and Sustainable Food	5
ENVS 131	Insect Ecology	5
ENVS 133	Agroecology Practicum	5
ENVS 138	Field Ethnobotany	5
ENVS 160	Restoration Ecology	5
ENVS 161A	Soils and Plant Nutrition	5
ENVS 162	Plant Physiological Ecology	5
ENVS 162L	Plant Physiological Ecology Laboratory	2
ENVS 163	Plant Disease Ecology	5
ENVS 163L	Plant Disease Ecology Lab	2

ENVS 164	Projects and Practices in Soil Ecology	5
ENVS 166	Agroecosystem Analysis and Watershed Management	5
ENVS 167	Freshwater and Wetland Ecology	5
ENVS 167L	Freshwater and Wetland Ecology Lab	2
ENVS 168	Biogeochemistry and the Global Environment	5
ENVS 169	Climate Change Ecology	5
ENVS 170	Agriculture and Climate Change	5

Courses based on the social sciences

ENVS 110	Institutions, the Environment, and Economic Systems	5
ENVS 130B	Justice and Sustainability in Agriculture	5
ENVS 140	National Environmental Policy	5
ENVS 141	Ecological Economics	5
ENVS 143	Sustainable Development: Economy, Policy, and Environment	5
ENVS 144	Global Climate Change Politics	5
ENVS 145	Green Cities	5
ENVS 146	Water Quality: Policy, Regulation, and Management	5
ENVS 147	Environmental Inequality/Environmental Justice	5
ENVS 149	Environmental Law and Policy	5
ENVS 150	Coastal and Marine Policy	5
ENVS 151	Environmental Assessment	5
ENVS 152	International Environmental Politics	5
ENVS 153	Globalization and the Environment: Trade Complements and Conflicts	5
ENVS 154	Amazonian Cultures and Conservation	5
ENVS 158	Political Ecology and Social Change	5
ENVS 165	Sustainable Water Systems	5
ENVS 172	Environmental Risks and Public Policy	5
ENVS 173	An Introduction to World Environmental History	5
ENVS 176	Vulnerability, Complex Systems, and Disasters	5

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement.

A primary goal of the environmental studies major is to train students who are able to critically analyze interdisciplinary environmental problems, justify their position on an issue, and communicate that position to a range of audiences verbally and in writing.

The DC requirement in environmental studies is satisfied by completing

ENVS 100	Ecology and Society	3
ENVS 100L	Ecology and Society Writing Laboratory	5

Plus one of the following

BIOE 151B	Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory	5
ENVS 183B	Senior Internship	5
ENVS 190	Capstone Course: Environmental Problem Solving	5
ENVS 195B	Senior Thesis Group	5
ENVS 196	Senior Seminar	5

ENVS 183B and ENVS 195B are usually taken after successfully completing ENVS 183A and ENVS 195A respectively.

Comprehensive Requirement

The senior comprehensive may be satisfied by completing one of the options listed below. All courses used to satisfy the senior comprehensive requirement must be taken for a letter grade.

Before enrolling in the senior thesis or senior internship option, students must formally apply to work with a particular faculty mentor very early in their thesis or project preparation. The senior thesis and senior internship option require careful planning, additional independent research, and at least a two-quarter commitment.

Students with advanced skills in one of the graduate focal areas may also take a graduate seminar by invitation from the instructor.

Either this course		
BIOE 151B	Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory	5
or these courses		
ENVS 183A	Senior Internship	5
ENVS 183B	Senior Internship	5
or this course		
ENVS 190	Capstone Course: Environmental Problem Solving	5

or these courses		
ENVS 195A	Senior Research	5
ENVS 195B	Senior Thesis Group	5
or this course		
ENVS 196	Senior Seminar	5

ENVS 190 is offered in the spring and summer.

Planners

The following are two sample academic plans for students pursuing the environmental studies B.A. major without a concentration. Plan One is for incoming frosh and Plan Two is for incoming transfer students.

Plan One for Incoming Frosh

	Fall	Winter	Spring
1st (frosh)	MAT H 3 or A M 3	SOC/ANTH/P HIL course	ENVS 23 or CHEM 1A
		ENVS 25	
2nd (soph)	ENV S 24 or BIOE 20C	ENVS 100 & ENVS 100L*	Upper-division ENVS
	STAT 7 & STAT 7L		
3rd (junior)	Upper-division ENV S (social science)	Upper-division ENVS (natural science)	Upper-division ENVS
4th (senior)	Upper-division ENV S	Upper-division ENVS	Upper-division ENVS
			Comprehensive requirement

*This course is also offered in the spring term.

Students completing this major will have satisfied the SI, IN, PE-E, IS, and PR-E general education requirements. In addition, they will need to fulfill all remaining university, college, and general education requirements.

Students interested in taking the senior thesis or senior internship as their comprehensive requirement must take ENV5 195A (thesis) or ENV5 183A (internship) in the quarter before completing ENV5 195B (thesis) or ENV5 183B (internship). Both the senior thesis and senior internship are two consecutive quarter commitments.

Plan Two for Incoming Transfer Students

	Fall	Winter	Spring
3rd (junior)	STAT 7 & STAT 7L	ENV5 100 & ENV5 100L*	Upper-division ENV5
		Upper- division ENV5	Upper-division ENV5 (social science)
4th (senior)	Upper- division ENV5	Upper- division ENV5	Comprehensive requirement
	Upper- division ENV5	Upper- division ENV5 (natural science)	

*This course is also offered in the spring term.

This planner assumes that a student has completed all required lower-division courses—including UCSC or community college general education requirements—with the exception of STAT 7 and STAT 7L, which is only offered at UC Santa Cruz.

Students interested in taking the senior thesis or senior internship as their comprehensive requirement must take ENV5 195A (thesis) or ENV5 183A (internship) in the quarter before completing ENV5 195B (thesis) or ENV5 183B (internship). Both the senior thesis and senior internship are two consecutive quarter commitments.

A transfer student who has completed the requirements for the Intersegmental General Education Transfer Curriculum (IGETC) before matriculating at UC Santa Cruz, with at most two course requirements left to complete, is allowed to satisfy IGETC in lieu of the UCSC general education requirements.

Geographic Information Systems Concentration

Course Requirements

Continuing students must complete all lower-division courses before taking ENV5 100 & ENV5 100L.

Lower-Division Courses

One of the following

CHEM 1A	General Chemistry	5
ENV5 23	The Physical and Chemical Environment	5

Plus one of the following courses

ENV5 24	General Ecology	5
BIOE 20C	Ecology and Evolution	5

Plus the following

ENV5 25	Environmental Policy and Economics	5
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Plus one of the following

One of the following

AM 3	Precalculus for the Social Sciences	5
AM 11A	Mathematical Methods for Economists I	5
AM 11B	Mathematical Methods for Economists II	5
MATH 3	Precalculus	5
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 22	Introduction to Calculus of Several Variables	5
MATH 23A	Vector Calculus	5

Or take a placement exam

Take the Math Placement Exam (MPE) with a score of 300 or higher or take the AP Calculus exam with a score of 3 or higher

Plus all of the following

STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

Plus one introductory course in sociology, cultural anthropology, or ethics

Students choose one of the following introductory courses in sociology, cultural anthropology, or ethics:

ANTH 2	Introduction to Cultural Anthropology	5			
BME 80G	Bioethics in the 21st Century: Science, Business, and Society	5			
PHIL 22	Introduction to Ethical Theory	5			
PHIL 24	Introduction to Ethics: Contemporary Moral Issues	5			
PHIL 28	Environmental Ethics	5			
SOCY 1	Introduction to Sociology	5			
SOCY 10	Issues and Problems in American Society	5			
SOCY 15	World Society	5			
Upper-Division Courses			Courses based on natural sciences		
Students are required to complete the following upper-division courses:			ENVS	Introduction to	5
All of the following			104A	Environmental Field Methods	
ENVS 100	Ecology and Society	3		Field Methods Laboratory	2
ENVS 100L	Ecology and Society Writing Laboratory	5		Natural History of Birds	5
Environmental studies core course is offered twice yearly during the winter and spring quarters.			ENVS	Natural History Field	5
Plus all of the following			106A	Natural History Field	5
ENVS 115A	Geographic Information Systems and Environmental Applications	5	ENVS	107A	Quarter
ENVS 115L	Exercises in Geographic Information Systems	2	ENVS	107B	Natural History Field
ENVS 115B	Intermediate Geographic Information Systems (GIS)	5	ENVS	107C	Quarter
ENVS 115C	Advanced Geographic Information Systems	5	ENVS 108	General Entomology	5
Electives			ENVS	General Entomology Laboratory	3
Four upper-division electives (environmental studies courses numbered ENVS 101 through ENVS 179).			108L	Laboratory	
One course must be from the list below of upper-division courses based on natural sciences, and one course must be from the list below of upper-division courses based on the social sciences.			BIOE 151A	Ecology and Conservation in Practice Supercourse: Ecological Field Methods	5
Lecture and lab combinations count as a single course.			BIOE 151B	Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory	5
A list of all courses offered by the Environmental Studies Department is available in the courses section of the catalog (p. Error! Bookmark not defined.). A list of which upper-division courses offered in the current year by the Environmental Studies Department are based in the natural sciences and which in the social sciences is available on the department website.			BIOE 151C	Ecology and Conservation in Practice Supercourse: Functions and Processes of Terrestrial Ecosystems	5
In addition to coursework, it is strongly recommended that students complete at least one internship related to GIS applications environmental problem-solving (either upper- or lower-division).			BIOE 151D	Ecology and Conservation in Practice Supercourse: Conservation in Practice	4
			ENVS 120	Conservation Biology	5
			ENVS 121	Landscape Ecology	5
			ENVS 122	Tropical Ecology and Conservation	5
			ENVS 123	Animal Ecology and Conservation	5
			BIOE 125	Ecosystems of California	5
			ENVS 129	Integrated Pest Management	5
			ENVS	Integrated Pest Management Laboratory	2
			129L	Laboratory	
			ENVS	Agroecology and Sustainable Agriculture	5
			130A	Sustainable Agriculture	
			ENVS	Agroecology and Sustainable Agriculture Laboratory	2
			130L	Laboratory	
			ENVS	Field Experiences in Agroecology and Sustainable Food	5
			130C	Sustainable Food	
			ENVS 131	Insect Ecology	5
			ENVS 133	Agroecology Practicum	5
			ENVS 138	Field Ethnobotany	5
			ENVS 160	Restoration Ecology	5
			ENVS	Soils and Plant Nutrition	5
			161A	Laboratory	
			ENVS 162	Plant Physiological Ecology	5
			ENVS	Plant Physiological Ecology Laboratory	2
			162L	Laboratory	
			ENVS 163	Plant Disease Ecology	5
			ENVS	Plant Disease Ecology Lab	2
			163L	Laboratory	

ENVS 164	Projects and Practices in Soil Ecology	5
ENVS 166	Agroecosystem Analysis and Watershed Management	5
ENVS 167	Freshwater and Wetland Ecology	5
ENVS 167L	Freshwater and Wetland Ecology Lab	2
ENVS 168	Biogeochemistry and the Global Environment	5
ENVS 169	Climate Change Ecology	5
ENVS 170	Agriculture and Climate Change	5
Courses based on the social sciences		
ENVS 110	Institutions, the Environment, and Economic Systems	5
ENVS 130B	Justice and Sustainability in Agriculture	5
ENVS 140	National Environmental Policy	5
ENVS 141	Ecological Economics	5
ENVS 143	Sustainable Development: Economy, Policy, and Environment	5
ENVS 144	Global Climate Change Politics	5
ENVS 145	Green Cities	5
ENVS 146	Water Quality: Policy, Regulation, and Management	5
ENVS 147	Environmental Inequality/Environmental Justice	5
ENVS 149	Environmental Law and Policy	5
ENVS 150	Coastal and Marine Policy	5
ENVS 151	Environmental Assessment	5
ENVS 152	International Environmental Politics	5
ENVS 153	Globalization and the Environment: Trade Complements and Conflicts	5
ENVS 154	Amazonian Cultures and Conservation	5
ENVS 158	Political Ecology and Social Change	5
ENVS 165	Sustainable Water Systems	5
ENVS 172	Environmental Risks and Public Policy	5
ENVS 173	An Introduction to World Environmental History	5
ENVS 176	Vulnerability, Complex Systems, and Disasters	5

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement.

A primary goal of the environmental studies major is to train students who are able to critically analyze interdisciplinary environmental problems, justify their position on an issue, and communicate that position to a range of audiences verbally and in writing.

The DC requirement in environmental studies is satisfied by completing

ENVS 100	Ecology and Society	3
ENVS 100L	Ecology and Society Writing Laboratory	5

Plus one of the following

ENVS 183B	Senior Internship	5
ENVS 195B	Senior Thesis Group	5
ENVS 196	Senior Seminar	5

ENVS 183B and ENVS 195B are usually taken after successfully completing ENVS 183A and ENVS 195A respectively.

Comprehensive Requirement

The senior comprehensive may be satisfied by completing one of the options listed below. All courses used to satisfy the senior comprehensive requirement must be taken for a letter grade. The topic engaged in the senior comprehensive courses must be relevant to the field of Geographic Information Systems. The relevance of the topic will be reviewed by the instructor of the senior comprehensive course.

Before enrolling in the senior thesis or senior internship option, students must formally apply to work with a particular faculty mentor very early in their thesis or project preparation. The senior thesis and senior internship options require careful planning, additional independent research, and at least a two-quarter commitment. The topic must be related to geographic information systems.

Either these courses		
ENVS 183A	Senior Internship	5
ENVS 183B	Senior Internship	5
or these courses		
ENVS 195A	Senior Research	5
ENVS 195B	Senior Thesis Group	5
or this course		
ENVS 196	Senior Seminar	5

ENVS 196 must be a topic related to geographic information systems

Planners

The following are two sample academic plans for students pursuing the environmental studies B.A. major with a concentration in geographic information systems. Plan One is for incoming frosh and Plan Two is for incoming transfer students.

Plan One for Incoming Frosh

Fall	Winter	Spring
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1st (fresh) MAT H 3 or AM 3

ENVS 25

ENVS 23 or CHEM 1A

SOC/ANTH/P
HIL course

2nd (soph) ENV S 24 or BIOE 20C

ENVS 100 & ENVS 100L*

ENVS upper-division

STAT 7 & STAT 7L

3rd (junior)

ENV S 115A & ENV S 115L

ENVS 115B

ENVS 115C

4th (senior)

ENV S upper-division (social science)

ENVS upper-division (natural science)

ENVS upper-division

Comprehensive requirement

*This course is also offered in the spring term.

This planner assumes that a student has placed into MATH 3 or AM 3.

Students completing this major will have satisfied SI, IN, PE-E, IS, and PR-E general education requirements. In addition, they will need to fulfill all remaining university, college, and general education requirements.

Students interested in taking the senior thesis or senior internship as their comprehensive requirement must take ENVS 195A (thesis) or ENVS 183A (internship) in the quarter before completing ENVS 195B (thesis) or ENVS 183B (internship). Both the senior thesis and senior internship are two consecutive quarter commitments.

Plan Two for Incoming Transfer Students

	Fall	Winter	Spring
1st (junior)	STAT 7 & STAT 7L	ENVS 100 & ENVS 100L* ENVS upper-division (social science)	ENVS upper-division (natural science)
2nd (senior)	ENVS 115A & ENVS 115L	ENVS 115B	ENVS 115C Comprehensive requirement

*This course is also offered in the spring term.

This planner assumes that a student has completed all required lower division courses—including UCSC or community college General Education requirements—with the exception of STAT 7 & STAT 7L, which is only offered at UC Santa Cruz.

Students interested in taking the senior thesis or senior internship as their comprehensive requirement must take ENVS 195A (thesis) or ENVS 183A (internship) in the quarter before completing ENVS 195B (thesis) or ENVS 183B (internship). Both the senior thesis and senior internship are two consecutive quarter commitments.

A transfer student who has completed the requirements for the Intersegmental General Education Transfer Curriculum (IGETC) before matriculating at UC Santa Cruz, with at most two course requirements left to complete, is allowed to satisfy IGETC in lieu of the UCSC general education requirements.

Global Environmental Justice Concentration

Course Requirements

Continuing students must complete all lower-division courses before taking ENVS 100 & ENVS 100L.

Lower-Division Courses

One of the following

CHEM 1A	General Chemistry	5
ENVS 23	The Physical and Chemical Environment	5

Plus one of the following courses

ENVS 24	General Ecology	5
BIOE 20C	Ecology and Evolution	5

Plus the following

ENVS 25	Environmental Policy and Economics	5
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Plus one of the following**One of the following**

AM 3	Precalculus for the Social Sciences	5
AM 11A	Mathematical Methods for Economists I	5
AM 11B	Mathematical Methods for Economists II	5
MATH 3	Precalculus	5
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 22	Introduction to Calculus of Several Variables	5
MATH 23A	Vector Calculus	5

Or take a placement exam

Take the Math Placement Exam (MPE) with a score of 300 or higher or take the AP Calculus exam with a score of 3 or higher

Plus all of the following

STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

Plus one introductory course in sociology, cultural anthropology, or ethics

Students choose one of the following introductory courses in sociology, cultural anthropology, or ethics:

ANTH 2	Introduction to Cultural Anthropology	5
BME 80G	Bioethics in the 21st Century: Science, Business, and Society	5
PHIL 22	Introduction to Ethical Theory	5
PHIL 24	Introduction to Ethics: Contemporary Moral Issues	5
PHIL 28	Environmental Ethics	5
SOCY 1	Introduction to Sociology	5

SOCY 10	Issues and Problems in American Society	5
SOCY 15	World Society	5

Upper-Division Courses

Students are required to complete the following upper-division courses:

All of the following

ENVS 100	Ecology and Society	3
ENVS 100L	Ecology and Society Writing Laboratory	5

Environmental studies core course is offered twice yearly during the winter and spring quarters.

Plus one of the following

ENVS 147	Environmental Inequality/Environmental Justice	5
ENVS 172	Environmental Risks and Public Policy	5

Plus one of the following

ENVS 158	Political Ecology and Social Change	5
ENVS 173	An Introduction to World Environmental History	5

Plus two of the following

No duplicate courses from lists above.

ENVS 130B	Justice and Sustainability in Agriculture	5
ENVS 140	National Environmental Policy	5
ENVS 143	Sustainable Development: Economy, Policy, and Environment	5
ENVS 147	Environmental Inequality/Environmental Justice	5
ENVS 154	Amazonian Cultures and Conservation	5
ENVS 158	Political Ecology and Social Change	5
ENVS 172	Environmental Risks and Public Policy	5
ENVS 173	An Introduction to World Environmental History	5
ENVS 176	Vulnerability, Complex Systems, and Disasters	5
CLTE 135	Apprenticeship in Community Engaged Research	5
SOCY 185	Environmental Inequality	5

Electives

Three upper-division electives (environmental studies courses numbered ENVS 101 – ENVS 179).

One course must be from the list below of upper division courses based on natural sciences.

Lecture and lab combinations count as a single course.

A list of all courses offered by the Environmental Studies Department is available in the courses section of the catalog (p. **Error! Bookmark not defined.**). A list of which upper-division courses offered in the current year by the Environmental Studies Department are based in the natural sciences and which in the social sciences is available on the department website.

Courses based on natural sciences

ENVS 104A	Introduction to Environmental Field Methods	5
ENVS 104L	Field Methods Laboratory	2
ENVS 106A	Natural History of Birds	5
ENVS 107A	Natural History Field Quarter	5
ENVS 107B	Natural History Field Quarter	5
ENVS 107C	Natural History Field Quarter	5
ENVS 108	General Entomology	5
ENVS 108L	General Entomology Laboratory	3
BIOE 151A	Ecology and Conservation in Practice Supercourse: Ecological Field Methods	5
BIOE 151B	Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory	5
BIOE 151C	Ecology and Conservation in Practice Supercourse: Functions and Processes of Terrestrial Ecosystems	5
BIOE 151D	Ecology and Conservation in Practice Supercourse: Conservation in Practice	4
ENVS 120	Conservation Biology	5
ENVS 121	Landscape Ecology	5
ENVS 122	Tropical Ecology and Conservation	5
ENVS 123	Animal Ecology and Conservation	5
BIOE 125	Ecosystems of California	5
ENVS 129	Integrated Pest Management	5
ENVS 129L	Integrated Pest Management Laboratory	2
ENVS 130A	Agroecology and Sustainable Agriculture	5
ENVS 130L	Agroecology and Sustainable Agriculture Laboratory	2
ENVS 130C	Field Experiences in Agroecology and Sustainable Food	5
ENVS 131	Insect Ecology	5
ENVS 133	Agroecology Practicum	5
ENVS 138	Field Ethnobotany	5
ENVS 160	Restoration Ecology	5

ENVS 161A	Soils and Plant Nutrition	5
ENVS 162	Plant Physiological Ecology	5
ENVS 162L	Plant Physiological Ecology Laboratory	2
ENVS 163	Plant Disease Ecology	5
ENVS 163L	Plant Disease Ecology Lab	2
ENVS 164	Projects and Practices in Soil Ecology	5
ENVS 166	Agroecosystem Analysis and Watershed Management	5
ENVS 167	Freshwater and Wetland Ecology	5
ENVS 167L	Freshwater and Wetland Ecology Lab	2
ENVS 168	Biogeochemistry and the Global Environment	5
ENVS 169	Climate Change Ecology	5
ENVS 170	Agriculture and Climate Change	5

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. A primary goal of the environmental studies major is to train students who are able to critically analyze interdisciplinary environmental problems, justify their position on an issue, and communicate that position to a range of audiences verbally and in writing.

The DC requirement in environmental studies is satisfied by completing

ENVS 100	Ecology and Society	3
ENVS 100L	Ecology and Society Writing Laboratory	5

Plus one of the following

ENVS 183B	Senior Internship	5
ENVS 190	Capstone Course: Environmental Problem Solving	5
ENVS 195B	Senior Thesis Group	5
ENVS 196	Senior Seminar	5

ENVS 183B and ENVS 195B are usually taken after successfully completing ENVS 183A and ENVS 195A respectively.

Comprehensive Requirement

The senior comprehensive may be satisfied by completing one of the options listed below. All courses used to satisfy the senior comprehensive requirement must be taken for a letter grade. The topic engaged in the senior comprehensive courses must be relevant to the field of global environmental justice.

Before enrolling in the senior thesis or senior internship option, students must formally apply to work with a particular faculty mentor very early in their thesis or

project preparation. The senior thesis and senior internship options require careful planning, additional independent research, and at least a two-quarter commitment. The topic must be related to global environmental justice.

Either these courses		
ENVS 183A	Senior Internship	5
ENVS 183B	Senior Internship	5
or this course		
ENVS 190	Capstone Course: Environmental Problem Solving	5
or these courses		
ENVS 195A	Senior Research	5
ENVS 195B	Senior Thesis Group	5
or this course		
ENVS 196	Senior Seminar	5

4th (senior)	ENV S upper division (natural science)	ENVS upper-division	ENVS upper-division
			Comprehensive requirement

*This course is also offered in the spring term.

Students completing this major will have satisfied SI, IN, PE-E, IS, IN, and PR-E general education requirements. In addition, they will need to fulfill all remaining university, college, and general education requirements.

Students interested in taking the senior thesis or senior internship as their comprehensive requirement must take ENVS 195A (thesis) or ENVS 183A (internship) in the quarter before completing ENVS 195B (thesis) or ENVS 183B (internship). Both the senior thesis and senior internship are two consecutive quarter commitments.

Planners

The following are two sample academic plans for students pursuing the environmental studies B.A. major with a concentration in global environmental justice. Plan One is for incoming frosh and Plan Two is for incoming transfer students.

Plan One for Incoming Frosh

	Fall	Winter	Spring
1st (frosh)	MAT H 3 or AM 3	ENVS 25 SOC/ANTH/P HIL course	ENVS 23 or CHEM 1A
2nd (soph)	ENV S 24 or BIOE 20C STAT 7 & STAT 7L	ENVS 100 & ENVS 100L*	ENVS 147 or ENVS 172
3rd (junior)	ENV S 158 or ENV S 173	ENVS upper-division (concentration elective)	ENVS upper-division (concentration elective)

Plan Two for Incoming Transfer Students

	Fall	Winter	Spring
1st (junior)	STAT 7 & STAT 7L	ENVS 100 & ENVS 100L* ENVS 147 or ENVS 172	ENVS upper-division (concentration elective)
2nd (senior)	ENVS 158 or ENV S 173	ENVS upper-division (concentration elective)	ENVS upper-division
	ENVS upper-division (natural science)	ENVS upper-division	Comprehensive requirement

*This course is also offered in the spring term.

This planner assumes that a student has completed all required lower division courses—including UCSC or community college general education requirements—with the exception of STAT 7 & STAT 7L, which is only offered at UC Santa Cruz.

Students interested in taking the senior thesis or senior internship as their comprehensive requirement must take ENVS 195A (thesis) or ENVS 183A (internship) in the quarter before completing ENVS 195B (thesis) or ENVS 183B (internship). Both the senior thesis and senior internship are two consecutive quarter commitments.

A transfer student who has completed the requirements for the Intersegmental General Education Transfer Curriculum (IGETC) before matriculating at UC Santa Cruz, with at most two course requirements left to complete, is allowed to satisfy IGETC in lieu of the UCSC general education requirements.

Conservation Science and Policy Concentration

Course Requirements

Continuing students are required to complete all six lower-division courses before taking ENVS 100 & ENVS 100L. Five of the lower-division courses are preset and are listed below. See the course descriptions for more specific information.

Lower-Division Courses

One of the following

CHEM 1A	General Chemistry	5
ENVS 23	The Physical and Chemical Environment	5

Plus one of the following courses

ENVS 24	General Ecology	5
BIOE 20C	Ecology and Evolution	5

Plus the following

ENVS 25	Environmental Policy and Economics	5
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Plus one of the following

One of the following

AM 3	Precalculus for the Social Sciences	5
AM 11A	Mathematical Methods for Economists I	5
AM 11B	Mathematical Methods for Economists II	5
MATH 3	Precalculus	5
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

MATH 22	Introduction to Calculus of Several Variables	5
MATH 23A	Vector Calculus	5

Or take a placement exam

Take the Math Placement Exam (MPE) with a score of 300 or higher or take the AP Calculus exam with a score of 3 or higher

Plus all of the following

STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

Plus one introductory course in sociology, cultural anthropology, or ethics

Students choose one of the following introductory courses in sociology, cultural anthropology, or ethics:

ANTH 2	Introduction to Cultural Anthropology	5
BME 80G	Bioethics in the 21st Century: Science, Business, and Society	5
PHIL 22	Introduction to Ethical Theory	5
PHIL 24	Introduction to Ethics: Contemporary Moral Issues	5
PHIL 28	Environmental Ethics	5
SOCY 1	Introduction to Sociology	5
SOCY 10	Issues and Problems in American Society	5
SOCY 15	World Society	5

Upper-Division Courses

Students are required to complete the following upper-division courses:

All of the following

ENVS 100	Ecology and Society	3
ENVS 100L	Ecology and Society Writing Laboratory	5

Environmental studies core course is offered twice yearly during the winter and spring quarters.

Plus one of the following

ENVS 120	Conservation Biology	5
ENVS 160	Restoration Ecology	5

Plus one of the following

ENVS 140	National Environmental Policy	5
ENVS 150	Coastal and Marine Policy	5

Plus two of the following

No duplicate courses from lists above.

Lecture/lab combinations count as a single course.

ENVS 110	Institutions, the Environment, and Economic Systems	5
ENVS 115A	Geographic Information Systems and Environmental Applications	5
ENVS 115L	Exercises in Geographic Information Systems	2
ENVS 120	Conservation Biology	5
ENVS 121	Landscape Ecology	5
ENVS 122	Tropical Ecology and Conservation	5
ENVS 123	Animal Ecology and Conservation	5
ENVS 140	National Environmental Policy	5
ENVS 141	Ecological Economics	5
ENVS 146	Water Quality: Policy, Regulation, and Management	5
ENVS 149	Environmental Law and Policy	5
ENVS 150	Coastal and Marine Policy	5
ENVS 151	Environmental Assessment	5
ENVS 160	Restoration Ecology	5
ENVS 165	Sustainable Water Systems	5
ENVS 167	Freshwater and Wetland Ecology	5

Field course

One of the following options:

One of the following field courses

ENVS 104A	Introduction to Environmental Field Methods	5
ENVS 104L	Field Methods Laboratory	2
ENVS 107A	Natural History Field Quarter	5
ENVS 107B	Natural History Field Quarter	5
ENVS 107C	Natural History Field Quarter	5
BIOE 114L	Field Methods in Herpetological Research	2
BIOE 128L	Large Marine Vertebrates Field Course	5
BIOE 141L	Behavioral Ecology Field Course	5
BIOE 145L	Field Methods in Plant Ecology	5
BIOE 150L	Ecological Field Methods Laboratory	5
BIOE 151A	Ecology and Conservation in Practice Supercourse: Ecological Field Methods	5
BIOE 151B	Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory	5

BIOE 151C	Ecology and Conservation in Practice Supercourse: Functions and Processes of Terrestrial Ecosystems	5
BIOE 151D	Ecology and Conservation in Practice Supercourse: Conservation in Practice	4
BIOE 161L	Kelp Forest Ecology Laboratory	5

The ENVS 104A & ENVS 104L lecture/lab combination counts as a single course.

Or UCNRS field course

Or a University of California Natural Reserve System (UCNRS) California Ecology and Conservation Field Course

Electives

Two upper-division electives (environmental studies courses numbered ENVS 101 – ENVS 179).

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. A primary goal of the environmental studies major is to train students who are able to critically analyze interdisciplinary environmental problems, justify their position on an issue, and communicate that position to a range of audiences verbally and in writing.

The DC requirement in environmental studies is satisfied by completing

ENVS 100	Ecology and Society	3
ENVS 100L	Ecology and Society Writing Laboratory	5

Plus one of the following

BIOE 151B	Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory	5
ENVS 183B	Senior Internship	5
ENVS 190	Capstone Course: Environmental Problem Solving	5
ENVS 195B	Senior Thesis Group	5
ENVS 196	Senior Seminar	5

ENVS 183B and ENVS 195B are usually taken after successfully completing ENVS 183A and ENVS 195A respectively.

Comprehensive Requirement

The senior comprehensive may be satisfied by completing one of the options listed below. All courses used to satisfy the senior comprehensive requirement must be taken for a letter grade. The topic engaged in senior comprehensive courses must be relevant to the

field of conservation science and policy. The relevance of the topic will be reviewed by the instructor of the senior comprehensive course.

Before enrolling in the senior thesis or senior internship option, students must formally apply to work with a particular faculty mentor very early in their thesis or project preparation. These courses require careful planning, additional independent research, and at least a two-quarter commitment. The topic must be related to conservation science and policy.

Either this course

BIOE 151B Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory 5

or these courses

ENVS 183A Senior Internship 5
ENVS 183B Senior Internship 5

or this course

ENVS 190 Capstone Course: Environmental Problem Solving 5

or these courses

ENVS 195A Senior Research 5
ENVS 195B Senior Thesis Group 5

or this course

ENVS 196 Senior Seminar 5

ENVS 196 must be a topic related to conservation science and policy.

Planners

The following are two sample academic plans for students pursuing the environmental studies B.A. major with a concentration in conservation science and policy. Plan One is for incoming frosh and Plan Two is for incoming transfer students.

Plan One for Incoming Frosh

	Fall	Winter	Spring
1st (frosh)	MAT H 3 or AM 3	ENVS 25 SOC/ANTH/P HIL course	ENVS 23 or CHEM 1A

2nd (soph)	ENV S 24 or BIOE 20C STAT 7 &	ENVS 100 & ENVS 100L*	ENVS 140 or ENVS 150
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STAT 7L

3rd (junior)

ENV S 120 or ENV S 160

ENVS upper-division (concentration elective)

ENVS upper-division (concentration elective)

4th (senior)

ENV S upper-division

ENVS upper-division (field course)

ENVS upper-division

Comprehensive requirement

*This course is also offered in the spring term.

Students completing this major will have satisfied SI, SR, IN, PE-E, IS, and PR-E general education requirements. In addition, they will need to fulfill all remaining university, college, and general education requirements.

Students interested in taking the senior thesis or senior internship as their comprehensive requirement must take ENVS 195A (thesis) or ENVS 183A (internship) in the quarter before completing ENVS 195B (thesis) or ENVS 183B (internship). Both the senior thesis and senior internship are two consecutive quarter commitments.

Plan Two for Incoming Transfer Students

	Fall	Winter	Spring
1st (junior)	STAT 7 & STAT 7L	ENVS 100 & ENVS 100L*	ENVS 140 or ENVS 150 ENVS upper-division (concentration elective)
2nd (senior)	ENVS 120 or ENVS 160 ENVS upper-	ENVS upper-division (concentration elective)	ENVS upper-division Comprehensive

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division

requirement

*This course is also offered in the spring term.

This planner assumes that a student has completed all required lower division courses—including UCSC or community college General Education requirements—with the exception of STAT 7 & STAT 7L, which is only offered at UC Santa Cruz.

Students interested in taking the senior thesis or senior internship as their comprehensive requirement must take ENV5 195A (thesis) or ENV5 183A (internship) in the quarter before completing ENV5 195B (thesis) or ENV5 183B (internship). Both the senior thesis and senior internship are two consecutive quarter commitments.

A transfer student who has completed the requirements for the Intersegmental General Education Transfer Curriculum (IGETC) before matriculating at UC Santa Cruz, with at most two course requirements left to complete, is allowed to satisfy IGETC in lieu of the UCSC general education requirements.

AGROECOLOGY B.A.

Information and Policies

Introduction

The agroecology major provides ecological concepts that can be applied to the development of sustainable agricultural systems. Students will develop their understanding of social, political, and economic aspects of agriculture. Students will also engage in hands-on experiences, and obtain skills in research, fieldwork, production, and communication in order to achieve multiple sustainability goals in complex, social-ecological food systems.

Students interested in the available concentrations should choose to pursue the environmental studies bachelor of arts (B.A.) degree.

Academic Advising for the Program

Advising is one way to make the most of your university experience. The advising system at UC Santa Cruz is amazing, and we encourage you to use it often. Ask questions, seek advice, and make decisions that work best for you.

To receive advising for this major, contact envsadv@ucsc.edu. Additional information for prospective transfer students can be found in the Transfer Information and Policy section.

Getting Started in the Major

Program Learning Outcomes

Students graduating with a B.A. degree in agroecology will be able to:

- Analyze the problems faced in agriculture and food systems by identifying the societal (historical, social, political, economic, cultural, and ethical) agents and structures that contribute to environmental change. (Social science competency)
- Describe the structure and functioning of major physical and ecological components of earth's systems, including agricultural systems. (Natural science competency)
- Access and assess complex literature and review specific topics in agroecology and sustainable food systems, and evaluate the usefulness and limitations of individual methods. (Analytical thinking)
- Demonstrate effective oral and written communication skills. (Communication skills)
- Demonstrate an introductory level of competence in horticulture or agronomy or aquaculture. (Production skills)

Major Qualification Policy and Declaration Process

Major Qualification

To qualify for the agroecology major, students must complete the specific courses listed below, or their approved equivalents.

One of the following

ENV5 23	The Physical and Chemical Environment	5
CHEM 1A	General Chemistry	5

Plus one of the following:

ENV5 24	General Ecology	5
BIOE 20C	Ecology and Evolution	5

Plus all of the following:

STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2
ENV5 25	Environmental Policy and Economics	5
ENV5 80F	Introduction to Agroecology and Sustainable Food Systems	5

Determining Qualification

Students who complete all the qualification courses with a grade of P, or letter grade of C or better are qualified to declare the major.

Students who have received one grade of NP, C-, D+, D, D-, or F in one of the qualification courses taken at UC Santa Cruz will only be qualified to declare after successfully completing the same or an equivalent course with a grade of P, or letter grade of C or better.

Students with two or more grades of NP, C-, D+, D, D-, or F in the qualification courses taken at UC Santa Cruz are not qualified to declare the major.

Students with AP credit (score of 3 or higher) for any of the qualification course(s) are qualified to declare after successfully completing the remaining qualification courses.

Students must attend an Environmental Studies Department declaration workshop when requesting to declare the major.

Appeal Process

Students who are not qualified to declare the major may appeal this decision by submitting an appeal to qualify for the major here within 15 days of the denial of the declaration. Within 15 days of receipt of the appeal, the department will notify the student and college of the decision. If a student has questions about the appeals process, they should contact envsadvi@ucsc.edu.

How to Declare a Major

All students are required to attend one declaration workshop offered during the first three weeks of the quarter they are eligible to declare. Before students attend declaration workshops, they should check to see if they are eligible to declare using the major qualification page. Students wishing to declare within the Environmental Studies Department should visit the Environmental Studies Department website and follow the steps listed in the "how to declare" tab. Degree requirement sheets may be downloaded from the Environmental Studies Undergraduate Program Requirements page.

Transfer Information and Policy

Transfer Admission Screening Policy

Students who apply for transfer admission to the major are required to have taken the equivalents of the following courses with a C grade (2.0) or better by the end of the spring term for students planning to enter in the fall:

One of the following:

ENVS 23 or a general chemistry course

Plus one of the following:

ENVS 24 General Ecology 5

BIOE 20C Ecology and Evolution 5

Plus one of the following:

AM 3 Precalculus for the Social Sciences 5

AM 6 Precalculus for Statistics 5
MATH 3 Precalculus 5

Plus one of the following options:

Either this course:

ENVS 25 Environmental Policy and Economics 5

Or these courses:

ECON 2 and a course in national or international politics

Or these courses:

ECON 1 and a course in national or international politics

GPA Requirement

To be considered for admission in the environmental studies majors, transfer students must pass the following courses or their equivalents of the following courses with a C (2.0) or better in the required courses.

General Education Courses (GEs)

Prospective students are also encouraged to complete the Intersegmental General Education Transfer Curriculum (IGETC) or to complete all UC Santa Cruz general education requirements before matriculation.

Recommended Courses

In addition, one of the following courses is recommended prior to transfer to ensure timely graduation.

SOCY 1	Introduction to Sociology	5
SOCY 10	Issues and Problems in American Society	5
SOCY 15	World Society	5
ANTH 2	Introduction to Cultural Anthropology	5
PHIL 22	Introduction to Ethical Theory	5
PHIL 24	Introduction to Ethics: Contemporary Moral Issues	5
PHIL 28	Environmental Ethics	5
BME 80G	Bioethics in the 21st Century: Science, Business, and Society	5

Getting Started at UCSC as a Transfer Student

Transfer students pursuing agroecology majors are encouraged to transfer in the fall quarter.

Transfer students should enroll in STAT 7 & STAT 7L during the summer or fall quarter and ENVS 80F in the fall in order to take ENVS 100 & ENVS 100L in winter or spring quarter of their first year. Transfer students who have completed the screening requirements listed above

can formally declare their major once STAT 7 & STAT 7L and ENVS 80F are completed. Transfer students can formally declare their major once qualification courses are successfully completed, following the steps in How to Declare a Major given above.

Courses recommended for transferring into the agroecology major include:

- ENVS 80F: Introduction to Agroecology and Sustainable Food Systems
- One of the following: SOCY 1, SOCY 10, SOCY 15, ANTH 2, PHIL 22, PHIL 24, PHIL 28, or PHIL 80G

ENVS 25 and CHEM 1A are usually offered during Summer Session at UC Santa Cruz, and transfer students are encouraged to take these classes if they have not yet completed a substitute requirement or if they want a better understanding of the relevant material. If you are transferring, compare catalog descriptions and consult your current institution's advisor to determine equivalency. Prospective transfer students should review the transfer information.

Students who are proposed in a different major and have advanced standing when they come to UC Santa Cruz require permission from the department to change into the major. Contact envsadv@ucsc.edu to request permission.

Letter Grade Policy

This program does not have a letter grade policy, except that the comprehensive requirement must be taken for a letter grade.

[Optional Catchall]

Course Substitution Policy

Of the four elective courses, agroecology students can substitute to take one elective course from:

- Another ENVS upper-division course (ENVS 104-ENVS 179) not listed as one of the four elective course options.
- A relevant course in SOCY, LALS, ANTH by petition*
- A relevant course taken in a study abroad program by petition*

*By petition: You may petition to substitute courses taken outside of ENVS and/or UC Santa Cruz such as other institutions, other departments, courses not listed on the pre-approved substitution list, other programs including Educational Abroad Program (EAP), Wildlands Studies, or the Sierra Institute. Please review the petitioning process on the department's website.

Double Majors and Major/Minor Combinations

Policy

Study Abroad

Students in environmental studies are encouraged to participate in Study Abroad programs and other off-campus programs. Students who are interested in these programs shall note the following policies:

- Students planning to study abroad must be declared in their major prior to studying abroad.
- Students must have the courses they plan to take abroad reviewed and approved by Environmental Studies Advising.
- Single environmental studies majors may petition to substitute up to two courses taken abroad to count toward the environmental studies upper-division electives. Agroecology majors may petition for one course to fulfill their four electives. Combined environmental studies majors cannot petition for substitution. Please review the petitioning process here prior to your EAP program. For more information on EAP, please visit the UC Education Abroad Program website.

Honors

Departmental Honors. Students must have a 3.5 grade point average (GPA) in all courses used to satisfy the environmental studies upper-division requirements. To be considered for departmental honors, students are limited to no more than one grade of P in those upper-division courses.

Senior Comprehensive Honors. Only applicable to a senior thesis, senior internship, or individual work in a senior seminar. Honors must be awarded by the student's faculty sponsor, and a second faculty member (chosen by the student's faculty advisor) must concur.

Highest Departmental Honors. Students must have a 3.75 GPA in all courses used to satisfy the environmental studies upper-division requirements and must also receive senior comprehensive honors (see above). To be considered for highest departmental honors, students are limited to no more than one grade of P in those upper-division courses.

[Optional Catchall]

Requirements and Planners

Course Requirements

Continuing students must complete all lower-division course requirements before taking ENVS 100 and ENVS 100L.

Lower-Division Courses

One of the following courses

ENVS 23 The Physical and
 Chemical Environment

CHEM 1A	General Chemistry	5		
Plus one of the following courses:			Plus one of the following courses:	
ENVS 24	General Ecology	5	ENVS 130C	Field Experiences in Agroecology and Sustainable Food
BIOE 20C	Ecology and Evolution	5	ENVS 133	Agroecology Practicum
			ENVS 135	Sustainable Aquaculture
Plus all of the following:			Plus four of the following:	
STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5	Not duplicating any courses taken from the above lists. Lecture and lab combinations count as a single course.	
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2	ENVS 108	General Entomology
ENVS 25	Environmental Policy and Economics	5	ENVS 108L	General Entomology Laboratory
ENVS 80F	Introduction to Agroecology and Sustainable Food Systems	5	ENVS 129	Integrated Pest Management
Plus one of the following:			ENVS 130C	Field Experiences in Agroecology and Sustainable Food
AM 3	Precalculus for the Social Sciences	5	ENVS 131	Insect Ecology
AM 6	Precalculus for Statistics	5	ENVS 133	Agroecology Practicum
MATH 3	Precalculus	5	ENVS 135	Sustainable Aquaculture
Plus one introductory course in sociology, cultural anthropology, or ethics			ENVS 142	Sustainable Energy
Choose one of the following:			ENVS 143	Sustainable Development: Economy, Policy, and Environment
ANTH 2	Introduction to Cultural Anthropology	5	ENVS 146	Water Quality: Policy, Regulation, and Management
BME 80G	Bioethics in the 21st Century: Science, Business, and Society	5	ENVS 160	Restoration Ecology
PHIL 22	Introduction to Ethical Theory	5	ENVS 161A	Soils and Plant Nutrition
PHIL 24	Introduction to Ethics: Contemporary Moral Issues	5	ENVS 162	Plant Physiological Ecology
PHIL 28	Environmental Ethics	5	ENVS 162L	Plant Physiological Ecology Laboratory
SOCY 1	Introduction to Sociology	5	ENVS 163	Plant Disease Ecology
SOCY 10	Issues and Problems in American Society	5	ENVS 163L	Plant Disease Ecology Lab
SOCY 15	World Society	5	ENVS 164	Projects and Practices in Soil Ecology
Upper-Division Courses			ENVS 165	Sustainable Water Systems
All of the following courses:			ENVS 166	Agroecosystem Analysis and Watershed Management
ENVS 100	Ecology and Society	3	ENVS 168	Biogeochemistry and the Global Environment
ENVS 100L	Ecology and Society Writing Laboratory	5	ENVS 169	Climate Change Ecology
ENVS 130A	Agroecology and Sustainable Agriculture	5	ENVS 170	Agriculture and Climate Change
ENVS 130L	Agroecology and Sustainable Agriculture Laboratory	2	BIOE 118	Plants and Society: the Biology of Food, Shelter, and Medicine
ENVS 130B	Justice and Sustainability in Agriculture	5	CMMU 149	Political Economy of Food and Agriculture
			CMMU 186	Food and Agriculture Social Movements

ENVS 100 and ENVS 100L are offered twice yearly during the winter and spring quarters. ENVS 130A and ENVS 130L are offered fall quarter only. ENVS 130B is offered winter quarter only.

Students can petition to take one elective course from: a) another ENVS upper-division course (ENVS 104A through ENVS 179) not listed above; b) a relevant course in SOCY, LALS, ANTH by petition; or c) a relevant course taken in a study abroad program by petition.

Please review the petition process listed on the department's website.

Required Internship or Independent Study

Complete one of the following in a topic related to agroecology, aquaculture, or sustainable food systems:

ENVS 83	Environmental Studies Internship	5
ENVS 184	Environmental Studies Internship	2
ENVS 199F	Tutorial	2

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. A primary goal of the environmental studies major is to train students who are able to critically analyze interdisciplinary environmental problems, justify their position on an issue, and communicate that position to a range of audiences verbally and in writing.

The DC requirement in agroecology is satisfied by completing:

ENVS 100	Ecology and Society	3
ENVS 100L	Ecology and Society Writing Laboratory	5

Plus one of the following:

ENVS 183B	Senior Internship	5
ENVS 190	Capstone Course: Environmental Problem Solving	5
ENVS 195B	Senior Thesis Group	5
ENVS 196	Senior Seminar	5

ENVS 183B and ENVS 195B are usually taken after successfully completing ENVS 183A and ENVS 195A respectively.

Comprehensive Requirement

The senior comprehensive may be satisfied by completing one of the options listed below. All courses used to satisfy the senior comprehensive requirement must be taken for a letter grade. The topic engaged in the senior comprehensive courses must be relevant to the field of agroecology.

Before enrolling in the senior thesis or senior internship option, students must formally apply to work with a particular faculty mentor very early in their thesis or project preparation. The senior thesis and senior internship option require careful planning, additional independent research, and at least a two-quarter commitment.

Students with advanced skills in one of the graduate focal areas may also take a graduate seminar by invitation from the instructor.

One of the following options

Either these courses			
ENVS 183A	Senior Internship		5
ENVS 183B	Senior Internship		5
or this course			
ENVS 190	Capstone Course: Environmental Problem Solving		5
or these courses			
ENVS 195A	Senior Research		5
ENVS 195B	Senior Thesis Group		5
or this course			
ENVS 196	Senior Seminar		5

Planners

The following are two sample academic plans for students pursuing the agroecology B.A. major. Plan One is for incoming frosh and Plan Two is for incoming transfer students.

Plan One for Incoming Frosh

	Fall	Winter	Spring
1st (frosh)	MAT H 3 or AM 3	SOCY/ANTH/e thics course	ENVS 23 or CHEM 1A
	ENV S 80F	ENVS 25	
2nd (soph)	ENV S 24 or BIOE 20C	ENVS 100 & ENVS 100L*	Upper- division elective
	STA T 7 & STA T 7L		ENVS 83 or ENVS 184 or ENVS 199F
3rd (junior)	ENV S 130A & ENV S 130L	ENVS 130B	ENVS 130C or ENVS 133
		ENVS 133 or ENVS 135	

4th (senior)	Upper-division elective	Upper-division elective	Upper-division elective
			Comprehensive requirement

*This course is also offered in the spring term

Students completing this major will have satisfied the SL, IN, PE-E, IS, and PR-E general education requirements needed to fulfill all remaining university, college, and general education requirements.

Students interested in taking the senior thesis or senior internship as their comprehensive requirement must take ENV5 195A (thesis) or ENV5 183A (internship) in the quarter before completing ENV5 195B (thesis) or ENV5 183B (internship). Both the senior thesis and senior internship are two consecutive quarter commitments.

Plan Two for Incoming Transfer Students

	Fall	Winter	Spring
3rd (junior)	STAT 7 & STAT 7L	ENV5 100 & ENV5 100L*	ENV5 130C or ENV5 133
	ENV5 80F	ENV5 130B	Upper-division elective
	ENV5 83 or ENV5 184 or ENV5 199F		
4th (senior)	ENV5 130A & ENV5 130L	ENV5 133 or ENV5 135	ENV5 130C
	Upper-division elective	Upper-division elective	Upper-division elective
			Comprehensive requirement

*This course is also offered in the spring term

This planner assumes a student has completed all lower-division courses except STAT 7 & STAT 7L and ENV5 80F before transferring to UCSC.

Students completing this major will have satisfied the SL, IN, PE-E, IS, and PR-E general education requirements

needed to fulfill all remaining university, college, and general education requirements.

Students interested in taking the senior thesis or senior internship as their comprehensive requirement must take ENV5 195A (thesis) or ENV5 183A (internship) in the quarter before completing ENV5 195B (thesis) or ENV5 183B (internship). Both the senior thesis and senior internship are two consecutive quarter commitments.

ENVIRONMENTAL STUDIES/BIOLOGY COMBINED MAJOR B.A.

Information and Policies

Introduction

This course of study provides students with the basic tools of biological science and sufficient understanding of resource conservation, conservation biology, and concerns about environmental sustainability to apply these tools to environmental problems.

Students interested in the available concentrations should choose to pursue the environmental studies B.A. degree. This does not apply to students who declared a combined major and concentration in agroecology and sustainable food systems prior to 2019.

Academic Advising for the Program

Advising is one way to make the most of your university experience. The advising system at UC Santa Cruz is amazing, and we encourage you to use it often. Ask questions, seek advice, and make decisions that work best for you.

To receive advising for this major, contact envsadvi@ucsc.edu. Additional information for prospective transfer students can be found in the Transfer Information and Policy section.

Getting Started in the Major

Program Learning Outcomes

Students graduating with a B.A. degree in environmental studies/biology combined will be able to:

- Identify the societal (social, political, economic and ethical) agents and structures that contribute to environmental change. (social science competency)
- Describe the structure and functioning of major physical and ecological components of the earth's systems. (natural science competency)
- Access and analyze a complex literature addressing specific topics in environmental studies, and evaluate the usefulness and limitations of individual sources of information. (analytic thinking)

- Demonstrate effective oral and written communication skills. (communication skills).

Major Qualification Policy and Declaration Process

Major Qualification

To qualify for the environmental studies/biology combined major, students must complete the specific courses listed below, or their approved equivalents.

All of the following:

ENVS 25	Environmental Policy and Economics	5
BIOE 20C	Ecology and Evolution	5
BIOL 20A	Cell and Molecular Biology	5
CHEM 1A	General Chemistry	5
STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

Students must take all of these courses for a letter grade.

Determining qualification

- Students who complete all the qualification courses with a letter grade of C or better are eligible to declare a major.
- Students who have received one grade of C-, D+, D, D-, or F in one of the qualification courses taken at UC Santa Cruz will only be eligible to declare after successfully completing the same or an equivalent course with a letter grade of C or better.
- Students with two or more grades of C-, D+, D, D-, or F in the qualification courses taken at UC Santa Cruz are not eligible to declare.
- Students with non-letter grades in any of the qualification courses for the environmental studies/biology combined B.A. major will not be eligible to declare until a grade of C or better has been assigned.
- Students must attend an Environmental Studies Department declaration workshop when requesting to declare the major.

Appeal Process

Students who are not qualified to declare the major may appeal this decision by submitting an appeal to qualify for the major within 15 days of the denial of the declaration. Within 15 days of receipt of the appeal, the department will notify the student and college of the decision. If a student has questions about the appeals process, they should contact envsadvi@ucsc.edu.

How to Declare a Major

All students are required to attend one declaration workshop offered during the first three weeks of the quarter they are eligible to declare. Before students attend declaration workshops, they should check to see if they are eligible to declare using the major qualification page. Students wishing to declare within the Environmental Studies Department should visit the Environmental Studies Department website and follow the steps listed in the "how to declare" tab. Degree requirement sheets may be downloaded from the Environmental Studies Undergraduate Program Requirements page.

Transfer Information and Policy

Transfer Admission Screening Policy

Students who apply for transfer admission to the major are required to have taken the equivalents of the following courses with a C grade (2.0) or better by the end of the spring term for students planning to enter in the fall:

All of the following

BIOE 20C	Ecology and Evolution	5
BIOL 20A	Cell and Molecular Biology	5
CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2

Plus one of the following

AM 3	Precalculus for the Social Sciences	5
AM 11A	Mathematical Methods for Economists I	5
AM 11B	Mathematical Methods for Economists II	5
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 22	Introduction to Calculus of Several Variables	5
MATH 23A	Vector Calculus	5

Plus one of the following options

ENVS 25; or ECON 1 and a course in national or international politics ; or ECON 2 and a course in national or international politics

Recommended Courses

In addition, one of the following courses is recommended prior to transfer to ensure timely graduation.

SOCY 1	Introduction to Sociology	5
SOCY 10	Issues and Problems in American Society	5
SOCY 15	World Society	5
ANTH 2	Introduction to Cultural Anthropology	5
PHIL 22	Introduction to Ethical Theory	5
PHIL 24	Introduction to Ethics: Contemporary Moral Issues	5
PHIL 28	Environmental Ethics	5
BME 80G	Bioethics in the 21st Century: Science, Business, and Society	5

And the following course

BIOE 20B	Development and Physiology	5
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GPA Requirement

To be considered for admission in the environmental studies majors, transfer students must pass the preceding courses or their equivalents of the preceding courses with a C (2.0) or better in the required courses.

General Education Courses

Prospective students are encouraged to prioritize required and recommended major preparation, and may additionally complete courses that articulate to UC Santa Cruz general education requirements as time allows.

Getting Started at UCSC as a Transfer Student

Transfer students pursuing environmental studies majors are encouraged to transfer in the fall quarter. Transfer students should enroll in STAT 7 and STAT 7L during the summer or fall quarter in order to take ENVS 100 and ENVS 100L in winter or spring quarter of their first year. Transfer students can formally declare their major once qualification courses are successfully completed, following the steps in How to Declare a Major given above.

ENVS 25 and CHEM 1A are usually offered during Summer Session at UC Santa Cruz, and transfer students are encouraged to take them if they have not completed a substitute requirement or want a better understanding of the relevant material. If you are transferring, compare catalog descriptions, consult your current institution's advisor, and refer to the ASSIST website to determine equivalency. Prospective transfer students should review the transfer information.

Students who are proposed in a different major and have advanced standing when they come to UC Santa Cruz require permission from the department to change into the major. Contact envsadvi@ucsc.edu to request permission.

Letter Grade Policy

All requirements for the environmental studies/biology combined major must be taken for a letter grade.

[Optional Catchall]**Course Substitution Policy**

Students pursuing the Environmental Studies/Biology Combined Major cannot substitute courses to count toward their upper division electives.

Double Majors and Major/Minor Combinations Policy**Study Abroad**

Students in environmental studies are encouraged to participate in Study Abroad programs and other off-campus programs. Students who are interested in these programs shall note the following policies:

- Students planning to study abroad must be declared in their major prior to studying abroad.
- Students must have their courses they plan to take abroad reviewed and approved by Environmental Studies Advising.
- Environmental studies/biology combined majors cannot petition their courses taken abroad for upper division course substitution.
- For more information on EAP, please visit the UC Education Abroad Program website.

Honors

Departmental Honors. Students must have a 3.5 grade point average (GPA) in all courses used to satisfy the environmental studies upper-division requirements.

Senior Comprehensive Honors. Only applicable to a senior thesis, senior internship, or individual work in a senior seminar. Honors must be awarded by the student's faculty sponsor, and a second faculty member (chosen by the student's faculty advisor) must concur.

Highest Departmental Honors. Students must have a 3.75 grade point average (GPA) in all courses used to satisfy the environmental studies upper-division requirements and must also receive senior comprehensive honors (see above). Students must fulfill all requirements for honors from environmental studies/biology combined.

[Optional Catchall]**Requirements and Planners****Course Requirements****Lower-Division Courses**

Biology and mathematics courses may require placement examinations. See the course descriptions for prerequisite information.

All of the following courses

BIOL 20A	Cell and Molecular Biology	5
BIOE 20B	Development and Physiology	5
BIOE 20C	Ecology and Evolution	5
ENVS 25	Environmental Policy and Economics	5

Plus one of the following

ANTH 2	Introduction to Cultural Anthropology	5
PHIL 22	Introduction to Ethical Theory	5
PHIL 24	Introduction to Ethics: Contemporary Moral Issues	5
PHIL 28	Environmental Ethics	5
BME 80G	Bioethics in the 21st Century: Science, Business, and Society	5
SOCY 1	Introduction to Sociology	5
SOCY 10	Issues and Problems in American Society	5
SOCY 15	World Society	5

Plus one of the following**One of the following:**

AM 3	Precalculus for the Social Sciences	5
AM 6	Precalculus for Statistics	5
MATH 3	Precalculus	5
AM 11A	Mathematical Methods for Economists I	5
AM 11B	Mathematical Methods for Economists II	5
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 22	Introduction to Calculus of Several Variables	5
MATH 23A	Vector Calculus	5

Or take a placement exam:

Take the Math Placement Exam (MPE) with a score of 300 or higher or take the AP Calculus exam with a score of 3 or higher.

Plus all of the following

STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

Plus all of the following

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2

Plus one of the following options in physics

Either this course		
PHYS 1	Physics for Everyone	5
or these courses		
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
or these courses		
PHYS 7A	Elementary Physics I	5
PHYS 7L	Elementary Physics Laboratory	1

Upper-Division Courses

Students are required to complete nine upper-division courses and the senior comprehensive requirement. Three of the nine upper-division courses must be the following courses (ENVS 100 and ENVS 100L is considered a single course).

ENVS 100	Ecology and Society	3
ENVS 100L	Ecology and Society Writing Laboratory	5
BIOL 105	Genetics	5
BIOE 109	Evolution	5

Electives

The remaining six upper-division elective courses include three in ecology and evolutionary biology (ecology and evolutionary biology courses numbered BIOE 107-BIOE 188) and three in environmental studies (environmental studies courses numbered ENVS 101-ENVS 179).

One of the six electives must be a laboratory course; laboratory courses are upper-division courses in BIOE or ENVS that carry 5 credits and have a "L" in their course number.

Additionally, one of the three environmental studies courses electives must be based in the social sciences selected from the following upper-division courses:

ENVS 110	Institutions, the Environment, and Economic Systems	5
ENVS 130B	Justice and Sustainability in Agriculture	5
ENVS 140	National Environmental Policy	5
ENVS 141	Ecological Economics	5
ENVS 143	Sustainable Development: Economy, Policy, and Environment	5
ENVS 145	Green Cities	5

ENVS 146	Water Quality: Policy, Regulation, and Management	5		Ecological Field Methods Laboratory	5
ENVS 147	Environmental Inequality/Environmental Justice	5	BIOE 159D	Marine Ecology Field Quarter: Methods in Field Ecology Laboratory	5
ENVS 149	Environmental Law and Policy	5	BIOE 161L	Kelp Forest Ecology Laboratory	5
ENVS 150	Coastal and Marine Policy	5	BIOE 163L	Ecology of Reefs, Mangroves, and Seagrasses Laboratory	2
ENVS 151	Environmental Assessment	5	BIOE 172L	Population Genetics Laboratory	2
ENVS 154	Amazonian Cultures and Conservation	5	ENVS 104L	Field Methods Laboratory	2
ENVS 158	Political Ecology and Social Change	5	ENVS 108L	General Entomology Laboratory	3
ENVS 165	Sustainable Water Systems	5	ENVS 115L	Exercises in Geographic Information Systems	2
ENVS 172	Environmental Risks and Public Policy	5	ENVS 129L	Integrated Pest Management Laboratory	2
ENVS 173	An Introduction to World Environmental History	5	ENVS 130L	Agroecology and Sustainable Agriculture Laboratory	2
ENVS 176	Vulnerability, Complex Systems, and Disasters	5	ENVS 162L	Plant Physiological Ecology Laboratory	2

One lab-based course

One of the six electives must be a laboratory course; laboratory courses are upper-division courses in BIOE or ENVS that carry 5 credits and have a "L" in their course number. In order to fulfill the lab-based requirement students must take the lecture and lab. Students must take the concurrent lecture and lab of one of the following:

BIOE 112L	Ornithology Field Studies	2
BIOE 117L	Systematic Botany of Flowering Plants Laboratory	2
BIOE 120L	Marine Botany Laboratory	2
BIOE 122L	Invertebrate Zoology Laboratory	2
BIOE 124L	Mammalogy Laboratory	2
BIOE 127L	Ichthyology Laboratory	2
BIOE 128L	Large Marine Vertebrates Field Course	5
BIOE 129L	Biology of Marine Mammals Laboratory	2
BIOE 131L	Animal Physiology Laboratory	2
BIOE 133L	Exercise Physiology Laboratory	2
BIOE 134L	Comparative Vertebrate Anatomy Laboratory	2
BIOE 135L	Plant Physiology Laboratory	2
BIOE 137L	Molecular Ecology Laboratory	2
BIOE 141L	Behavioral Ecology Field Course	5
BIOE 145L	Field Methods in Plant Ecology	5
BIOE 150L	Ecological Field Methods Laboratory	5
BIOE 151B	Ecology and Conservation in Practice Supercourse:	5

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement for the environmental studies/biology combined major is satisfied by completing:

The DC requirement in environmental studies/biology combined is satisfied by completing

ENVS 100	Ecology and Society	3
ENVS 100L	Ecology and Society Writing Laboratory	5

Plus one of the following

Where two-credit lab courses have to be taken concurrently with a 5-credit lecture course, the combination counts as one course.

BIOE 151B	Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory	5
ENVS 183B	Senior Internship	5
ENVS 190	Capstone Course: Environmental Problem Solving	5
ENVS 195B	Senior Thesis Group	5
ENVS 196	Senior Seminar	5
BIOE 108	Marine Ecology	5
BIOE 114	Herpetology	5

BIOE 114L	Field Methods in Herpetological Research	2	BIOE 151B	Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory	5
BIOE 120	Marine Botany	5			
BIOE 120L	Marine Botany Laboratory	2			
BIOE 122	Invertebrate Zoology	5	or these		
BIOE 122L	Invertebrate Zoology Laboratory	2	courses		
BIOE 127	Ichthyology	5	ENVS 183A	Senior Internship	5
BIOE 127L	Ichthyology Laboratory	2	ENVS 183B	Senior Internship	5
BIOE 128L	Large Marine Vertebrates Field Course	5	or this		
BIOE 129	Biology of Marine Mammals	5	course		
BIOE 129L	Biology of Marine Mammals Laboratory	2	ENVS 190	Capstone Course: Environmental Problem Solving	5
BIOE 137	Molecular Ecology	5	or these		
BIOE 141L	Behavioral Ecology Field Course	5	courses		
BIOE 145	Plant Ecology	5	ENVS 195A	Senior Research	5
BIOE 145L	Field Methods in Plant Ecology	5	ENVS 195B	Senior Thesis Group	5
BIOE 150	Ecological Field Methods	5	or this		
BIOE 150L	Ecological Field Methods Laboratory	5	course		
BIOE 151B	Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory	5	ENVS 196	Senior Seminar	5
BIOE 153C	Disciplinary Communication for Biologists	5			
BIOE 158L	Field Methods in Marine Ecology	5			
BIOE 159A	Marine Ecology Field Quarter: Marine Ecology with Laboratory	5			
BIOE 161L	Kelp Forest Ecology Laboratory	5			
BIOE 172	Population Genetics	5			
BIOE 172L	Population Genetics Laboratory	2			

ENVS 190 is offered in the spring and summer.

ENVS 183B and ENVS 195B are usually taken after successfully completing ENVS 183A and ENVS 195A respectively.

Planners

The following are two sample academic plans for students pursuing the environmental studies/biology combined B.A. major. Plan One is for incoming frosh and Plan Two is for incoming transfer students.

Plan One for Incoming Frosh

	Fall	Winter	Spring
1st (frosh)	MATH 3 or AM 3	CHE M 1A	CHEM 1B
		ENVS 25	SOCY/ANTH/PHIL course
2nd (soph)	BIOE 20C	ENVS 100 & ENVS 100L*	BIOE 20B
	STAT 7 & STAT 7L	BIOL 20A	CHEM 1C & CHEM 1N
3rd (junior)	BIOL 105	BIOE 109	Upper-division BIOE
	Upper-division	PHYS 1	Upper-division ENVS

Comprehensive Requirement

The senior comprehensive may be satisfied by completing one of the options listed below. All courses used to satisfy the senior comprehensive requirement must be taken for a letter grade.

Before enrolling in the senior thesis or senior internship option, students must formally apply to work with a particular faculty mentor very early in their thesis or project preparation. The senior thesis and senior internship option require careful planning, additional independent research, and at least a two-quarter commitment.

Students with advanced skills in one of the graduate focal areas may also take a graduate seminar by invitation from the instructor.

Either this course

	ENVS		
4th (senior)	Upper-division BIOE	Upper-division BIOE	Comprehensive requirement
	Upper-division ENVS (social sciences)		

*This course is also offered in the spring term.

This plan does not explicitly show the required lab course among the ENVS or BIOE electives.

Students completing this major will have satisfied the SI, IN, PE-E, IS, and PR-E general education requirements. In addition, they will need to fulfill all remaining university, college, and general education requirements.

Students interested in taking the senior thesis or senior internship as their comprehensive requirement must take ENVS 195A (thesis) or ENVS 183A (internship) in the quarter before completing ENVS 195B (thesis) or ENVS 183B (internship). Both the senior thesis and senior internship are two consecutive quarter commitments.

Plan Two for Incoming Transfer Students

	Fall	Winter	Spring
3rd (junior)	STAT 7 & STAT 7L	ENVS 100 & ENVS 100L*	Upper-division ENVS
		BIOL 105	BIOE 109
4th (senior)	Upper-division ENVS (social sciences)	Upper-division ENVS	Upper-division BIOE
	Upper-division BIOE	Upper-division PHYS 1	Comprehensive requirement

*This course is also offered in the spring term.

This plan does not include the required lab based course. Students must complete the lab-based requirement with the courses listed in the course requirements.

This planner assumes that a student has completed all required lower-division courses—including UCSC or community college general education requirements—with the exception of STAT 7 and STAT 7L, which is only offered at UC Santa Cruz.

Students interested in taking the senior thesis or senior internship as their comprehensive requirement must take ENVS 195A (thesis) or ENVS 183A (internship) in the quarter before completing ENVS 195B (thesis) or ENVS 183B (internship). Both the senior thesis and senior internship are two consecutive quarter commitments.

A transfer student who has completed the requirements for the Intersegmental General Education Transfer Curriculum (IGETC) before matriculating at UC Santa Cruz, with at most two course requirements left to complete, is allowed to satisfy IGETC in lieu of the UCSC general education requirements.

ENVIRONMENTAL STUDIES/EARTH SCIENCES COMBINED MAJOR B.A.

Information and Policies

Introduction

This course of study provides students with the basic tools of Earth sciences and environmental studies needed to address environmental problems.

Students interested in the available concentrations should choose to pursue the environmental studies B.A. degree. This does not apply to students who declared a combined major and concentration in agroecology and sustainable food systems prior to 2019.

Academic Advising for the Program

Advising is one way to make the most of your university experience. The advising system at UC Santa Cruz is amazing, and we encourage you to use it often. Ask questions, seek advice, and make decisions that work best for you.

To receive advising for this major, contact envsadv@ucsc.edu. Additional information for prospective transfer students can be found in the Transfer Information and Policy section.

Getting Started in the Major

Program Learning Outcomes

Students graduating with a B.A. degree in environmental studies/Earth sciences combined will be able to:

- Identify the societal (social, political, economic and ethical) agents and structures that contribute to environmental change. (social science competency)

- Describe the structure and functioning of major physical and ecological components of the earth's systems. (natural science competency)
- Access and analyze a complex literature addressing specific topics in environmental studies, and evaluate the usefulness and limitations of individual sources of information. (analytic thinking)
- Demonstrate effective oral and written communication skills. (communication skills).

Major Qualification Policy and Declaration Process

Major Qualification

To qualify for the environmental studies/Earth sciences combined major, students must complete the specific courses listed below, or their approved equivalents.

One of the following

ENVS 24	General Ecology	5
BIOE 20C	Ecology and Evolution	5

Plus all of the following

ENVS 25	Environmental Policy and Economics	5
CHEM 1A	General Chemistry	5
STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

Determining qualification

- Students who complete all the qualification courses with a grade of P, or letter grade of C or better are qualified to declare a major.
- Students who have received one grade of C-, D+, D, D-, or F in one of the qualification courses taken at UC Santa Cruz will only be qualified to declare after successfully completing the same or an equivalent course with a letter grade of C or better.
- Students with two or more grades of C-, D+, D, D-, or F in the qualification courses taken at UC Santa Cruz are not qualified to declare the major.
- Students with AP credit (score of 3 or higher) for any of the qualification course(s) are qualified to declare after successfully completing the remaining qualification courses.
- Students must attend an Environmental Studies Department declaration workshop when requesting to declare the major.

Appeal Process

Students who are not qualified to declare the major may appeal this decision by submitting an appeal to qualify for the major within 15 days of the denial of the declaration. Within 15 days of receipt of the appeal, the department will notify the student and college of the decision. If a student has questions about the appeals process, they should contact envsadvi@ucsc.edu.

How to Declare a Major

All students are required to attend one declaration workshop offered during the first three weeks of the quarter they are eligible to declare. Before students attend declaration workshops, they should check to see if they are eligible to declare using the major qualification page. Students wishing to declare within the Environmental Studies Department should visit the Environmental Studies Department website and follow the steps listed in the "how to declare" tab. Degree requirement sheets may be downloaded from the Environmental Studies Undergraduate Program Requirements page.

Transfer Information and Policy

Transfer Admission Screening Policy

Students who apply for transfer admission to the major are required to have taken the equivalents of the following courses with a C grade (2.0) or better by the end of the spring term for students planning to enter in the fall:

One of the following

ENVS 24	General Ecology	5
BIOE 20C	Ecology and Evolution	5

Plus all of the following

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1M	General Chemistry Laboratory	2
CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2

Plus one of the following courses

AM 3	Precalculus for the Social Sciences	5
MATH 3	Precalculus	5
MATH 11A	Calculus with Applications	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5

Plus one of the following options

Either ENVS 25; or ECON 1 and a course in national or international politics; or or ECON 2 and a course in national or international politics.

GPA Requirement

To be considered for admission in the environmental studies majors, transfer students must pass the following courses or their equivalents of the following courses with a C (2.0) or better in the required courses.

Recommended courses

In addition, the following courses are recommended prior to transfer to ensure timely graduation.

MATH 11A	Calculus with Applications	5
EART 5	California Geology	5
EART 5L	California Geology Laboratory	1
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 6B	Introductory Physics II	5
PHYS 6M	Introductory Physics II Laboratory	1

And one of the following courses

SOCY 1	Introduction to Sociology	5
SOCY 10	Issues and Problems in American Society	5
SOCY 15	World Society	5
ANTH 2	Introduction to Cultural Anthropology	5
PHIL 22	Introduction to Ethical Theory	5
PHIL 24	Introduction to Ethics: Contemporary Moral Issues	5
PHIL 28	Environmental Ethics	5
BME 80G	Bioethics in the 21st Century: Science, Business, and Society	5

Prospective students are encouraged to prioritize required and recommended major preparation, and may additionally complete courses that articulate to UC Santa Cruz general education requirements as time allows.

Getting Started at UCSC as a Transfer Student

Transfer students pursuing environmental studies majors are encouraged to transfer in the fall quarter.

Transfer students should enroll in STAT 7 and STAT 7L during the summer or fall quarter in order to take ENVS 100 and ENVS 100L in winter or spring quarter of their first year. Transfer students who have completed the screening requirements listed above can formally declare their major, following the steps in How to Declare a Major given above.

ENVS 25 and CHEM 1A are usually offered during Summer Session at UC Santa Cruz, and transfer students are encouraged to take them if they have not completed a substitute requirement or want a better understanding of

the relevant material. If you are transferring, compare catalog descriptions, consult your current institution's adviser, and refer to the ASSIST website to determine equivalency. Prospective transfer students should review the transfer information.

Prospective transfer students should review transfer information on the environmental studies transfer information.

Students who are proposed in a different major and have advanced standing when they come to UC Santa Cruz require permission from the department to change into the major. Contact envsadv@ucsc.edu to request permission.

Letter Grade Policy

This program does not have a letter grade policy, except that the senior comprehensive requirement must be taken for a letter grade.

[Optional Catchall]

Course Substitution Policy

Students pursuing the Environmental Studies/Earth Sciences Combined Major cannot substitute courses to count toward their upper division electives.

Double Majors and Major/Minor Combinations Policy

Study Abroad

Students in environmental studies are encouraged to participate in Study Abroad programs and other off-campus programs. Students who are interested in these programs shall note the following policies:

- Students planning to study abroad must be declared in their major prior to studying abroad.
- Students must have their courses they plan to take abroad reviewed and approved by Environmental Studies Advising.
- Environmental studies combined majors cannot petition their courses taken abroad for upper division course substitution.
- For more information on EAP, please visit the UC Education Abroad Program website.

Honors

Departmental Honors. Students must have a 3.5 grade point average (GPA) in all courses used to satisfy the environmental studies upper-division requirements. To be considered for departmental honors, students are limited to no more than one grade of P in those upper-division courses.

Senior Comprehensive Honors. Only applicable to a senior thesis, senior internship, or individual work in a

senior seminar. Honors must be awarded by the student's faculty sponsor, and a second faculty member (chosen by the student's faculty adviser) must confer.

Highest Departmental Honors. Students must have a 3.75 grade point average (GPA) in all courses used to satisfy the environmental studies upper-division requirements and must also receive senior comprehensive honors (see above). To be considered for highest departmental honors, students are limited to no more than one grade of P in those upper-division courses.

Students must fulfill all requirements for honors from environmental studies and biology.

[Optional Catchall]

Requirements and Planners

Course Requirements

Lower-Division Courses

Both of the following

STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

Plus one of the following options

Either these courses		
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5
or these courses		
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

Plus all of the following

CHEM 1A	General Chemistry	5
CHEM 1B	General Chemistry	5
CHEM 1M	General Chemistry Laboratory	2
CHEM 1C	General Chemistry	5
CHEM 1N	General Chemistry Laboratory	2

Plus one of the following options

Either these courses		
PHYS 6A	Introductory Physics I	5
PHYS 6L	Introductory Physics I Laboratory	1
PHYS 6B	Introductory Physics II	5

PHYS 6M	Introductory Physics II Laboratory	1
or these courses		
PHYS 5A	Introduction to Physics I	5
PHYS 5L	Introduction to Physics I Laboratory	1
PHYS 5B	Introduction to Physics II	5
PHYS 5M	Introduction to Physics II Laboratory	1

Plus one of the following options

Either these courses		
EART 20	Environmental Geology	5
EART 20L	Environmental Geology Laboratory	1
or these courses		
EART 5	California Geology	5
EART 5L	California Geology Laboratory	1
or these courses		
EART 10	Geologic Principles	5
EART 10L	Geologic Principles Laboratory	1

Plus one of the following

ENVS 24	General Ecology	5
BIOE 20C	Ecology and Evolution	5

Plus the following

ENVS 25	Environmental Policy and Economics	5
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Plus one of the following

ANTH 2	Introduction to Cultural Anthropology	5
PHIL 22	Introduction to Ethical Theory	5
PHIL 24	Introduction to Ethics: Contemporary Moral Issues	5
PHIL 28	Environmental Ethics	5
BME 80G	Bioethics in the 21st Century: Science, Business, and Society	5
SOCY 1	Introduction to Sociology	5
SOCY 10	Issues and Problems in American Society	5
SOCY 15	World Society	5

Upper-Division Courses

One of the following options

Either these courses		
EART 110A	Evolution of the Earth	5
EART 110L	Evolution of the Earth Laboratory	2
or these courses		

EART 110B	Earth as a Chemical System	5	ENVS 165	Sustainable Water Systems	5
EART 110M	Earth as a Chemical System Laboratory	2	ENVS 172	Environmental Risks and Public Policy	5
or these courses			ENVS 173	An Introduction to World Environmental History	5
EART 110C	The Dynamic Earth	5	ENVS 176	Vulnerability, Complex Systems, and Disasters	5
EART 110N	The Dynamic Earth Laboratory	2			

Plus all of the following

ENVS 100	Ecology and Society	3
ENVS 100L	Ecology and Society Writing Laboratory	5

Electives

The upper-division courses should be selected in pursuit of a coherent plan of study, such as water policy-hydrology, restoration ecology-geochemistry, agroecology-soil physical processes, or environmental policy-climate change, among others, in consultation with faculty from both the Environmental Studies and Earth and Planetary Sciences departments. None of the three environmental studies upper-division courses can be an environmental studies internship, individual study or substitution course.

Three upper-division environmental studies courses

Three additional upper-division environmental studies courses (numbered ENVS 101-ENVS 179) including at least one course based in the social sciences selected from the following upper-division courses:

ENVS 110	Institutions, the Environment, and Economic Systems	5
ENVS 130B	Justice and Sustainability in Agriculture	5
ENVS 140	National Environmental Policy	5
ENVS 141	Ecological Economics	5
ENVS 143	Sustainable Development: Economy, Policy, and Environment	5
ENVS 145	Green Cities	5
ENVS 146	Water Quality: Policy, Regulation, and Management	5
ENVS 147	Environmental Inequality/Environmental Justice	5
ENVS 149	Environmental Law and Policy	5
ENVS 150	Coastal and Marine Policy	5
ENVS 151	Environmental Assessment	5
ENVS 154	Amazonian Cultures and Conservation	5
ENVS 158	Political Ecology and Social Change	5

None of the three environmental studies upper-division courses can be an environmental studies internship, individual study or substitution course.

Three upper-division Earth sciences courses

Three additional upper-division Earth sciences courses (Earth and Planetary Sciences courses numbered EART 100-EART 191C). A list of the upper-division courses offered by the Earth and Planetary Sciences Department is available on the department website (p. **Error! Bookmark not defined.**).

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement for the environmental studies/Earth sciences combined major is satisfied by completing:

The following courses:

ENVS 100	Ecology and Society	3
ENVS 100L	Ecology and Society Writing Laboratory	5

Plus one of the following options:

Either one of these courses		
BIOE 151B	Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory	5
ENVS 183B	Senior Internship	5
ENVS 190	Capstone Course: Environmental Problem Solving	5
ENVS 195B	Senior Thesis Group	5
ENVS 196	Senior Seminar	5
EART 195	Senior Thesis	5
or these courses		
EART 189A	Geographic Information Systems with Applications in Earth Sciences	5
EART 189B	Summer Field Study	5

Students taking the cross-listed course BIOE 151B/ENVS 109B are recommended to enroll in ENVS 109B.

Comprehensive Requirement

Students satisfy the senior comprehensive requirement in environmental studies or Earth sciences by completing either:

- One of the senior comprehensive options for single environmental studies B.A. majors (see options listed below);
- One of the senior comprehensive options for Earth sciences B.S. (see Comprehensive Requirement under the Earth Sciences B.S.).

The senior comprehensive may be satisfied by completing one of the options listed below. All courses used to satisfy the senior comprehensive requirement must be taken for a letter grade.

Before enrolling in the senior thesis or senior internship option, students must formally apply to work with a particular faculty mentor very early in their thesis or project preparation. The senior thesis and senior internship option require careful planning, additional independent research, and at least a two-quarter commitment.

Students with advanced skills in one of the graduate focal areas may also take a graduate seminar by invitation from the instructor.

Either this course

BIOE 151B	Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory	5
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or these courses

ENVS 183A	Senior Internship	5
ENVS 183B	Senior Internship	5

or this course

ENVS 190	Capstone Course: Environmental Problem Solving	5
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or these courses

ENVS 195A	Senior Research	5
ENVS 195B	Senior Thesis Group	5

or this course

ENVS 196	Senior Seminar	5
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Students taking the cross-listed course BIOE 151B/ENVS 109B are recommended to enroll in ENVS 109B.

ENVS 190 is offered in the spring and summer.

ENVS 183B and ENVS 195B are usually taken after successfully completing ENVS 183A and ENVS 195A respectively.

Planners

The following are two sample academic plans for students pursuing the environmental studies B.A. major without a concentration. Plan One is for incoming frosh and Plan Two is for incoming transfer students.

Plan One for Incoming Frosh

	Fall	Winter	Spring
1st (frosh)	MATH 3 or AM 3	ENVS 25	CHEM 1A
		EART 5 & EART 5L	SOCY/ANTH/PHIL course
2nd (soph)	ENVS 24 or BIOE 20C	ENVS 100 & ENVS 100L*	CHEM 1B & CHEM 1M
	STAT 7 & STAT 7L	MAT H 11A	PHYS 6A & PHYS 6L or PHYS 5A & PHYS 5L
3rd (junior)	CHEM 1C & CHEM 1N	Upper-division ENVS	PHYS 6B & PHYS 6M or PHYS 5B & PHYS 5M
	MATH 11B	EART 110B & EART 110M	Upper-division ENVS
4th (senior)	Upper-division EART	Upper-division EART	Upper-division EART
	Upper-division ENVS (social sciences)		Comprehensive requirement

*This course is also offered in the spring term.

This planner assumes that a student has placed into MATH 3 or AM 3.

Students completing this major will have satisfied the SI, IN, PE-E, IS, IN, MF, and PR-E general education requirements. In addition, they will need to fulfill all remaining university, college, and general education requirements.

Students interested in taking the senior thesis or senior internship as their comprehensive requirement must take

ENVS 195A (thesis) or ENVS 183A (internship) in the quarter before completing ENVS 195B (thesis) or ENVS 183B (internship). Both the senior thesis and senior internship are two consecutive quarter commitments.

Plan Two for Incoming Transfer Students

	Fall	Winter	Spring
3rd (junior)	STAT 7 & 7L	ENVS 100 & 100L*	Upper-division EART
	MATH 11B	EART 110B & EART 110M	Upper-division ENVS
4th (senior)	Upper-division ENVS	Upper-division ENVS (social sciences)	Comprehensive requirement
	Upper-division EART	Upper-division EART	

*This course is also offered in the spring term.

This planner assumes that a student has completed all required lower-division courses—including UCSC or community college general education requirements—with the exception of STAT 7 and STAT 7L, which is only offered at UC Santa Cruz.

A transfer student who has completed the requirements for the Intersegmental General Education Transfer Curriculum (IGETC) before matriculating at UC Santa Cruz, with at most two course requirements left to complete, is allowed to satisfy IGETC in lieu of the UCSC general education requirements.

Students interested in taking the senior thesis or senior internship as their comprehensive requirement must take ENVS 195A (thesis) or ENVS 183A (internship) in the quarter before completing ENVS 195B (thesis) or ENVS 183B (internship). Both the senior thesis and senior internship are two consecutive quarter commitments.

ENVIRONMENTAL STUDIES/ECONOMICS COMBINED MAJOR B.A.

Information and Policies

Introduction

This major provides students with the basic tools of economic analysis and an understanding of the mechanics of resource production, conservation, and use, in both ecological and economic terms.

Students interested in the available concentrations should pursue the environmental studies B.A. degree. This does not apply to students who declared a combined major and concentration in agroecology and sustainable food systems prior to 2019.

Academic Advising for the Program

Advising is one way to make the most of your university experience. The advising system at UC Santa Cruz is amazing, and we encourage you to use it often. Ask questions, seek advice, and make decisions that work best for you.

To receive advising for this major, contact envsadvi@ucsc.edu. Additional information for prospective transfer students can be found in the Transfer Information and Policy section.

Getting Started in the Major

Program Learning Outcomes

Students graduating with a B.A. degree in environmental studies/economics combined will be able to:

- Identify the societal (social, political, economic and ethical) agents and structures that contribute to environmental change. (social science competency)
- Describe the structure and functioning of major physical and ecological components of the earth's systems. (natural science competency)
- Access and analyze a complex literature addressing specific topics in environmental studies, and evaluate the usefulness and limitations of individual sources of information. (analytic thinking)
- Demonstrate effective oral and written communication skills. (communication skills).

Major Qualification Policy and Declaration Process

Major Qualification

To qualify for the environmental studies/economics combined major, students must complete the specific courses listed below, or their approved equivalents.

One of the following:

ENVS 23	The Physical and Chemical Environment	5
CHEM 1A	General Chemistry	5

Plus one of the following

ENVS 24	General Ecology	5
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BIOE 20C	Ecology and Evolution	5
Plus all of the following		
ENVS 25	Environmental Policy and Economics	5
ECON 1	Introductory Microeconomics: Resource Allocation and Market Structure	5
AM 11A	Mathematical Methods for Economists I	5
STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

Determining Qualification

- Students who complete all the qualification courses with a grade of P, or letter grade of C or better are qualified to declare the major.
- Students who have received one grade of C-, D+, D, D-, or F in one of the qualification courses taken at UC Santa Cruz will only be qualified to declare the major after successfully completing the same or an equivalent course with a letter grade of C or better.
- Students with two or more grades of C-, D+, D, D-, or F in the qualification courses taken at UC Santa Cruz are not qualified to declare the major.
- Students with AP credit (score of 3 or higher) for any of the qualification course(s) are qualified to declare after successfully completing the remaining qualification courses.
- Students must attend an Environmental Studies Department declaration workshop when requesting to declare the major.

Appeal Process

Students who are not qualified to declare the major may appeal this decision by submitting an appeal to qualify for the major within 15 days of the denial of the declaration. Within 15 days of receipt of the appeal, the department will notify the student and college of the decision. If a student has questions about the appeals process, they should contact envsadvi@ucsc.edu.

How to Declare a Major

All students are required to attend one declaration workshop offered during the first three weeks of the quarter they are eligible to declare. Before students attend declaration workshops, they should check to see if they are eligible to declare using the major qualification page. Students wishing to declare within the Environmental Studies Department should visit the Environmental Studies Department website and follow

the steps listed in the "how to declare" tab. Degree requirement sheets may be downloaded from the Environmental Studies Undergraduate Program Requirements page.

Transfer Information and Policy

Transfer Admission Screening Policy

Students who apply for transfer admission to the major are required to have taken the equivalents of the following courses with a C grade (2.0) or better by the end of the spring term for students planning to enter in the fall:

One of the following:

ENVS 23 or a general chemistry course

Plus one of the following:

ENVS 24	General Ecology	5
BIOE 20C	Ecology and Evolution	5

Plus the following:

ECON 1 or ECON 2 and a course in national or international politics

Plus one of the following:

AM 11A	Mathematical Methods for Economists I	5
MATH 11A	Calculus with Applications	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5

Recommended Courses

In addition, one of the following courses is recommended prior to transfer to ensure timely graduation.

SOCY 1	Introduction to Sociology	5
SOCY 10	Issues and Problems in American Society	5
SOCY 15	World Society	5
ANTH 2	Introduction to Cultural Anthropology	5
PHIL 22	Introduction to Ethical Theory	5
PHIL 24	Introduction to Ethics: Contemporary Moral Issues	5
PHIL 28	Environmental Ethics	5
BME 80G	Bioethics in the 21st Century: Science, Business, and Society	5

And all of the following courses

ECON 1	Introductory Microeconomics: Resource Allocation and Market Structure	5
ECON 2	Introductory Macroeconomics: Aggregate Economic Activity	5

AM 11B Mathematical Methods for 5
Economists II

GPA Requirement

To be considered for admission in the environmental studies majors, transfer students must pass the preceding courses or their equivalents of the following courses with a C (2.0) or better in the required courses.

General Education (GEs)

Prospective students are encouraged to prioritize required and recommended major preparation, and may additionally complete courses that articulate to UC Santa Cruz general education requirements as time allows.

Getting Started at UCSC as a Transfer Student

Transfer students pursuing environmental studies majors are encouraged to transfer in the fall quarter.

Transfer students should plan to enroll in ECON 100A or ECON 100M and STAT 7/STAT 7L during the summer or fall quarter, and ECON 113 in the winter quarter in order to take ENVS 100 and ENVS 100L in spring quarter of their first year. Transfer students who have completed the screening requirements listed above can formally declare their major, following the steps in How to Declare a Major given above.

ENVS 25 and CHEM 1A are usually offered during Summer Session at UC Santa Cruz, and transfer students are encouraged to take them if they have not completed a substitute requirement or want a better understanding of the relevant material. If you are transferring, compare catalog descriptions, consult your current institution's advisor, and refer to the ASSIST website to determine equivalency. Prospective transfer students should review the transfer information.

Students who are proposed in a different major and have advanced standing when they come to UC Santa Cruz require permission from the department to change into the major. Contact envsadvi@ucsc.edu to request permission.

Letter Grade Policy

This program does not have a letter grade policy, except that the senior comprehensive requirement must be taken for a letter grade.

[Optional Catchall]

Course Substitution Policy

Students pursuing the environmental studies/economics combined major cannot substitute courses to count toward their upper-division electives.

Double Majors and Major/Minor Combinations

Policy

Study Abroad

Students in environmental studies are encouraged to participate in Study Abroad programs and other off-campus programs. Students who are interested in these programs shall note the following policies:

- Students planning to study abroad must be declared in their major prior to studying abroad.
- Students must have their courses they plan to take abroad reviewed and approved by Environmental Studies Advising.
- Environmental studies combined majors cannot petition their courses taken abroad for upper division course substitution.
- For more information on EAP, please visit the UC Education Abroad Program website.

Honors

Departmental Honors. Students must have a 3.5 grade point average (GPA) in all courses used to satisfy the environmental studies upper-division requirements. To be considered for departmental honors, students are limited to no more than one grade of P in those upper-division courses.

Senior Comprehensive Honors. Only applicable to a senior thesis, senior internship, or individual work in a senior seminar. Honors must be awarded by the student's faculty sponsor, and a second faculty member (chosen by the student's faculty advisor) must confer.

Highest Departmental Honors. Students must have a 3.75 grade point average (GPA) in all courses used to satisfy the environmental studies upper-division requirements and must also receive senior comprehensive honors (see above). To be considered for highest departmental honors, students are limited to no more than one grade of P in those upper-division courses.

Students must fulfill all requirements for honors from environmental studies and biology.

[Optional Catchall]

Requirements and Planners

Course Requirements

Lower-Division Courses

All of the following courses

ECON 1	Introductory Microeconomics: Resource Allocation and Market Structure	5
ECON 2	Introductory Macroeconomics:	5

	Aggregate Economic Activity	
AM 11A	Mathematical Methods for Economists I	5
AM 11B	Mathematical Methods for Economists II	5
STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

Plus one of the following

ENVS 23	The Physical and Chemical Environment	5
CHEM 1A	General Chemistry	5

Plus one of the following

ENVS 24	General Ecology	5
BIOE 20C	Ecology and Evolution	5

Plus the following

ENVS 25	Environmental Policy and Economics	5
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Plus one of the following

ANTH 2	Introduction to Cultural Anthropology	5
PHIL 22	Introduction to Ethical Theory	5
PHIL 24	Introduction to Ethics: Contemporary Moral Issues	5
PHIL 28	Environmental Ethics	5
BME 80G	Bioethics in the 21st Century: Science, Business, and Society	5
SOCY 1	Introduction to Sociology	5
SOCY 10	Issues and Problems in American Society	5
SOCY 15	World Society	5

Upper-Division Courses**One of the following**

ECON 100A	Intermediate Microeconomics	5
ECON 100M	Intermediate Microeconomics, Math Intensive	5

And all of the following

ECON 113	Introduction to Econometrics	5
ENVS 100	Ecology and Society	3
ENVS 100L	Ecology and Society Writing Laboratory	5

Electives

Six upper-division elective courses, three in economics and three in environmental studies.

Economics electives

Economics electives must be chosen from the following list:

ECON 100B	Intermediate Macroeconomics	5
ECON 100N	Intermediate Macroeconomics, Math Intensive	5
ECON 101	Managerial Economics	5
ECON 114	Advanced Quantitative Methods	5
ECON 115	Introduction to Management Sciences	5
ECON 120	Development Economics	5
ECON 128	Poverty and Public Policy	5
ECON 130	Money and Banking	5
ECON 131	International Financial Markets	5
ECON 133	Security Markets and Financial Institutions	5
ECON 135	Corporate Finance	5
ECON 136	Business Strategy	5
ECON 138	The Economics and Management of Technology and Innovation	5
ECON 139A	The Economics of Electronic Commerce	5
ECON 139B	E-Commerce Strategy	5
ECON 140	International Trade	5
ECON 141	International Finance	5
ECON 142	Advanced Topics in International Economics	5
ECON 150	Public Finance	5
ECON 156	Health Care and Medical Economics	5
ECON 159	The Economics of Organizations	5
ECON 160A	Industrial Organization	5
ECON 160B	Government and Industry	5
ECON 161A	Marketing	5
ECON 162	Legal Environment of Business	5
ECON 165	Economics as an Experimental Science	5
ECON 169	Economic Analysis of the Law	5
ECON 170	Environmental Economics	5
ECON 175	Energy Economics	5
ECON 180	Labor Economics	5
ECON 183	Women in the Economy	5

Environmental studies electives

Environmental studies electives must be chosen from those numbered ENVS 101 through ENVS 179, with at least one course based in the natural sciences selected from the following upper-division courses (lecture and lab combinations count as a single course):

ENVS 104A	Introduction to Environmental Field Methods	5
ENVS 104L	Field Methods Laboratory	2
ENVS 106A	Natural History of Birds	5
ENVS 107A	Natural History Field Quarter	5
ENVS 107B	Natural History Field Quarter	5
ENVS 107C	Natural History Field Quarter	5
ENVS 108	General Entomology	5
ENVS 108L	General Entomology Laboratory	3
BIOE 151A	Ecology and Conservation in Practice Supercourse: Ecological Field Methods	5
BIOE 151B	Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory	5
BIOE 151C	Ecology and Conservation in Practice Supercourse: Functions and Processes of Terrestrial Ecosystems	5
BIOE 151D	Ecology and Conservation in Practice Supercourse: Conservation in Practice	4
ENVS 120	Conservation Biology	5
ENVS 121	Landscape Ecology	5
ENVS 122	Tropical Ecology and Conservation	5
ENVS 123	Animal Ecology and Conservation	5
BIOE 125	Ecosystems of California	5
ENVS 129	Integrated Pest Management	5
ENVS 129L	Integrated Pest Management Laboratory	2
ENVS 130A	Agroecology and Sustainable Agriculture	5
ENVS 130L	Agroecology and Sustainable Agriculture Laboratory	2
ENVS 130C	Field Experiences in Agroecology and Sustainable Food	5
ENVS 131	Insect Ecology	5
ENVS 133	Agroecology Practicum	5
ENVS 138	Field Ethnobotany	5
ENVS 160	Restoration Ecology	5
ENVS 161A	Soils and Plant Nutrition	5
ENVS 162	Plant Physiological Ecology	5
ENVS 162L	Plant Physiological Ecology Laboratory	2
ENVS 163	Plant Disease Ecology	5
ENVS 163L	Plant Disease Ecology Lab	2
ENVS 164	Projects and Practices in Soil Ecology	5

ENVS 166	Agroecosystem Analysis and Watershed Management	5
ENVS 167	Freshwater and Wetland Ecology	5
ENVS 167L	Freshwater and Wetland Ecology Lab	2
ENVS 168	Biogeochemistry and the Global Environment	5
ENVS 169	Climate Change Ecology	5
ENVS 170	Agriculture and Climate Change	5

None of the three environmental studies upper-division courses can be an environmental studies internship, individual study or substitution course.

A list of which upper-division courses offered in the current year by the Environmental Studies Department are based in the natural sciences and in the social sciences is available on the department's website.

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement for the environmental studies/economics combined major is satisfied by completing:

The following courses:

ENVS 100	Ecology and Society	3
ENVS 100L	Ecology and Society Writing Laboratory	5

Plus one of the following

BIOE 151B	Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory	5
ENVS 183B	Senior Internship	5
ENVS 190	Capstone Course: Environmental Problem Solving	5
ENVS 195B	Senior Thesis Group	5
ENVS 196	Senior Seminar	5

Students taking the cross-listed course BIOE 151B/ENVS 109B are recommended to enroll in ENVS 109B.

ENVS 183B and ENVS 195B are usually taken after successfully completing ENVS 183A and ENVS 195A respectively.

Comprehensive Requirement

Students satisfy the senior comprehensive requirement by completing both of the following:

- One of the options for environmental studies B.A.
- Pass those portions of the economics comprehensive examination administered in ECON 100A and ECON 113.

The senior comprehensive may be satisfied by completing one of the options listed below. All courses used to satisfy the senior comprehensive requirement must be taken for a letter grade.

Before enrolling in the senior thesis or senior internship option, students must formally apply to work with a particular faculty mentor very early in their thesis or project preparation. The senior thesis and senior internship option require careful planning, additional independent research, and at least a two-quarter commitment.

Students with advanced skills in one of the graduate focal areas may also take a graduate seminar by invitation from the instructor.

Either this course
 BIOE 151B Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory 5

or these courses
 ENVS 183A Senior Internship 5
 ENVS 183B Senior Internship 5

or this course
 ENVS 190 Capstone Course: Environmental Problem Solving 5

or these courses
 ENVS 195A Senior Research 5
 ENVS 195B Senior Thesis Group 5

or this course
 ENVS 196 Senior Seminar 5

Students taking the cross-listed course BIOE 151B/ENVS 109B are recommended to enroll in ENVS 109B.

ENVS 190 is offered in the spring and summer.

ENVS 183B and ENVS 195B are usually taken after successfully completing ENVS 183A and ENVS 195A respectively.

Planners

The following are two sample academic plans for students pursuing the environmental studies/economics combined B.A. major without a concentration. Plan One is for incoming frosh and Plan Two is for incoming transfer students.

Plan One for Incoming Frosh

	Fall	Winter	Spring
1st (frosh)	MATH 3 or AM 3	ENVS 25	ENVS 23 or CHEM 1A
2nd		ECON 1	ECON 2

2nd (soph)	ENVS 24 or BIOE 20C	STAT 5 or STAT 7 & STAT 7L	SOCY/ANTH/ethics course
	AM 11A/EC ON 11A	AM 11B/EC ON 11B	ECON 100A or ECON 100M

3rd (junior)	ECON 113	ENVS 100 & ENVS 100L*	Upper-division ENVS (natural science)
		Upper-division ECON	Upper-division ECON

4th (senior)	Upper-division ENVS	Upper-division ENVS	Comprehensive requirement
	Upper-division ECON		

*This course is also offered in the spring term.

This planner assumes that a student has placed into MATH 3 or AM 3.

Students completing this major will have satisfied the SI, IN, PE-E, IS, PE-H, MF, and PR-E general education requirements. In addition, they will need to fulfill all remaining university, college, and general education requirements.

Students interested in taking the senior thesis or senior internship as their comprehensive requirement must take ENVS 195A (thesis) or ENVS 183A (internship) in the quarter before completing ENVS 195B (thesis) or ENVS 183B (internship). Both the senior thesis and senior internship are two consecutive quarter commitments.

Plan Two for Incoming Transfer Students

	Fall	Winter	Spring
3rd (junior)	ECON 100A or ECON 100M	ECON 113	Upper-division ENVS (natural sciences)
	STAT 7 & STAT 7L	ENVS 100 & ENVS 100L	Upper-division ECON

4th (senior)	Upper- division ENVS	Upper- division ENVS	Comprehensive requirement
	Upper- division ECON	Upper- division ECON	

This planner assumes that a student has completed all required lower-division courses—including UCSC or community college general education requirements.

A transfer student who has completed the requirements for the Intersegmental General Education Transfer Curriculum (IGETC) before matriculating at UC Santa Cruz, with at most two course requirements left to complete, is allowed to satisfy IGETC in lieu of the UCSC general education requirements.

Students interested in taking the senior thesis or senior internship as their comprehensive requirement must take ENVS 195A (thesis) or ENVS 183A (internship) in the quarter before completing ENVS 195B (thesis) or ENVS 183B (internship). Both the senior thesis and senior internship are two consecutive quarter commitments.

ENVIRONMENTAL STUDIES PH.D.

Introduction

Advancement to Candidacy

A three-person interdisciplinary guidance committee works to ensure that each student's preparation is individually designed to meet particular needs and interests, to help ensure their success as scholars, and to help students fully engage interdisciplinary dimensions of their training and research. One committee member is the major professor and at least one member needs to be from a complementary meta-discipline from the student's general research area. For instance, a student whose interests are in conservation science may have two committee members who are ecologists and one who is a political scientist.

Course Requirements

All of the following courses:

ENVS 201A	Research Approaches in Environmental Studies	5
ENVS 201B	Environmental Studies In Practice	5

Plus one of the following courses from natural sciences

ENVS 220	Conservation Biology	5
ENVS 230	Agroecology and Sustainable Agriculture	5

Plus one of the following courses from social

sciences: ENVS 210	Political Ecological Thought and Environment	5
ENVS 240	Public Policy and Conservation	5

Plus all of the following:

- An approved graduate course in quantitative methods that provides a basis in research design and analysis;
- An approved graduate course in qualitative methods that provides a basis in research design and analysis;
- An approved graduate elective course that provides focused expertise.

In addition, all students are required to participate in three quarters of:

ENVS 290L	Graduate Research Seminar	2
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Before advancement to candidacy:

Every quarter before advancement to candidacy, all students are required to participate in:

ENVS 290	Interdisciplinary Research Seminar AND	2
ENVS 292	Topics in Research in Environmental Studies	2

Teaching Requirements

Students are expected to serve as teaching assistants in undergraduate courses for two quarters.

Post-Qualifying Requirements

Foreign Language Requirements

If the venue of a student's research is in a non-English-speaking country, certification of competence in the language of that country may be required before advancement to candidacy.

Qualifying Examination

The qualifying examination committee includes an additional member from outside the environmental studies department, and helps guide the student to define and plan their dissertation research. This committee is responsible for certifying that the student is qualified to advance to candidacy for the Ph.D. degree. The qualifying examination must be completed by the end of the third year.

Pre-Qualifying Requirements

The interdisciplinary guidance committee helps guide the student in preparation for pre-qualifying examinations in three general areas of scholarly interest, and depending on the student's background, interests, and intentions,

may require additional coursework, including courses from other departments. The pre-qualifying examination must be taken no later than winter quarter of the third year.

Dissertation

Dissertation

A dissertation in environmental studies is expected to present an original contribution to the understanding of a significant environmental problem or issue. It should demonstrate a clear understanding of the relevant literature, careful and rigorous research design and data analysis, and effective communication of the results within the context of the student's area of emphasis. The dissertation is guided by a committee that includes both natural and social scientists.

Dissertation Defense

Academic Progress

The typical duration of the doctoral program is five to six years.

Applying for Graduation

ENVIRONMENTAL STUDIES DESIGNATED EMPHASIS

Introduction

The designated emphasis is the equivalent of a "minor" for doctoral study. It will provide you with a framework for in-depth study in specialized fields in your area, and an opportunity for recognition of particular scholarly expertise.

Requirements

Complete the Environmental Studies Designated Emphasis Plan and contact the Graduate Program coordinator if you are interested in taking the Environmental Studies Designated Emphasis Plan. You must declare your intent to complete a designated emphasis in environmental studies before you officially advance to candidacy.

Committee Composition and Departmental Approvals

An environmental studies faculty member is required to act as your designated emphasis advisor. They will advise you about coursework as you complete the Environmental Studies Designated Emphasis Plan, serve on your qualifying examination committee, and your dissertation reading committee.

Course Requirements

Doctoral students from other departments at UC Santa Cruz may complete a designated emphasis in environmental studies by completing

ENVS 201A	Research Approaches in Environmental Studies	5
ENVS 201B	Environmental Studies In Practice	5

Two advanced graduate courses or seminars

Take two advanced graduate courses or seminars from the departmentally approved list below (current list is also provided on the ENVS DE Plan), and participate for at least two quarters in an environmental studies graduate research group registered under ENVS 292, Topics in Research in Environmental Studies.

ENVS 210	Political Ecological Thought and Environment	5
ENVS 220	Conservation Biology	5
ENVS 230	Agroecology and Sustainable Agriculture	5
ENVS 235	Social Theories of Nature	5
ENVS 240	Public Policy and Conservation	5
ENVS 247	Regional Approaches to Environmental Policy	5
ENVS 263	Plant Disease Ecology	5
ENVS 271	Valuing the Environment	5
ENVS 280	Advanced Topics in Environmental Studies	5
ENVS 291	Advanced Readings in Environmental Studies	3
ENVS 291C	Advanced Readings in Risk and Public Policy	3
ENVS 291D	Advanced Readings in Tropical Ecology, Agriculture, and Development	3
ENVS 291M	Advanced Readings in Biogeochemistry	3
ENVS 291P	Advanced Readings in Environmental History and Anthropology	3

Plus

Participate for at least two quarters in an environmental studies graduate research group registered under ENVS 292, Topics in Research in Environmental Studies.

ENVS 292	Topics in Research in Environmental Studies	2
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Writing, Research and/or Teaching Requirements

Include a significant scholarly written component (i.e., a chapter of the student's dissertation or a paper to be submitted for publication) on an appropriate environmental topic.

[Optional Catchall]

ENVIRONMENTAL STUDIES COURSE LISTS

Pre-Approved Upper-Division Substitutions for ENVS Single Majors

Course Lists**Anthropology**

ANTH 110E	Anthropology of Global Environmental Change	5
ANTH 110W	Land and Waterscapes Entropology	5
ANTH 111	Human Ecology	5
ANTH 146	Anthropology and the Environment	5
ANTH 161	The Anthropology of Food	5
ANTH 173	Origins of Farming	5

Biology (Ecology and Evolutionary)

BIOE 107	Ecology	5
BIOE 108	Marine Ecology	5
BIOE 109	Evolution	5
BIOE 112	Ornithology	5
BIOE 112L	Ornithology Field Studies	2
BIOE 114	Herpetology	5
BIOE 114L	Field Methods in Herpetological Research	2
BIOE 117	Systematic Botany of Flowering Plants	5
BIOE 117L	Systematic Botany of Flowering Plants Laboratory	2
BIOE 118	Plants and Society: the Biology of Food, Shelter, and Medicine	5
BIOE 120	Marine Botany	5
BIOE 120L	Marine Botany Laboratory	2
BIOE 122	Invertebrate Zoology	5
BIOE 122L	Invertebrate Zoology Laboratory	2
BIOE 124	Mammalogy	5
BIOE 124L	Mammalogy Laboratory	2
BIOE 127	Ichthyology	5
BIOE 127L	Ichthyology Laboratory	2
BIOE 129	Biology of Marine Mammals	5
BIOE 129L	Biology of Marine Mammals Laboratory	2
BIOE 139	Mathematical Modeling and Data Science in Ecology and Evolution	5
BIOE 140	Behavioral Ecology	5
BIOE 145	Plant Ecology	5
BIOE 147	Community Ecology	5
BIOE 149	Disease Ecology	5
BIOE 150	Ecological Field Methods	5
BIOE 155	Freshwater Ecology	5
BIOE 161	Kelp Forest Ecology	5
BIOE 163	Ecology of Reefs, Mangroves, and Seagrasses	5
BIOE 165	Marine Conservation Biology	5

Community Studies

CMMU 149	Political Economy of Food and Agriculture	5
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CMMU 186	Food and Agriculture Social Movements	5
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Earth and Planetary Sciences

EART 100	Vertebrate Paleontology	5
EART 100L	Vertebrate Paleontology Laboratory	2
EART 102	Marine Geology	5
EART 104	Geologic Hazards	5
EART 105	Coastal Geology	5
EART 107	Remote Sensing of the Environment	5
EART 109	Elements of Field Geology	5
EART 109L	Field Geology Laboratory	2
EART 110A	Evolution of the Earth	5
EART 110B	Earth as a Chemical System	5
EART 110C	The Dynamic Earth	5
EART 116	Hydrology	5
EART 121	The Atmosphere	5
EART 140	Geomorphology	5
EART 142	Engineering Geology for Environmental Scientists	5
EART 146	Groundwater	5
EART 148	Glaciology	5

Economics

ECON 170	Environmental Economics	5
ECON 171	Natural Resource Economics	5
ECON 175	Energy Economics	5

Education

EDUC 185C	Introduction to Teaching Science	5
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Electrical Engineering

ECE 180J	Advanced Renewable Energy Sources, Storage, and Smart Grids	5
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History

HIS 177	Smoke, Smallpox, and the Sublime: Thinking about the Environment in the 19th Century	5
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Legal Studies

LGST 131	Wildlife, Wilderness, and the Law	5
LGST 137	International Environmental Law and Policy	5

Microbiology and Environmental Toxicology

METX 101	Sources and Fates of Pollutants	5
METX 144	Groundwater Contamination	5

METX 151	Scientific Writing and Presentation	5
Ocean Sciences		
OCEA 101	The Marine Environment	5
OCEA 102	Oceans and Climate: Past, Present, and Future	5
OCEA 130	Biological Oceanography	5
Politics		
POLI 114	Thinking Green: Politics, Philosophies, and Practices of Sustainability	5
POLI 132	California Water Law and Policy	5
POLI 174	Global Political Ecology	5
Sociology		
SOCY 125	Society and Nature	5
SOCY 130	Sociology of Food	5
SOCY 173	Water	5
SOCY 173X	Water and Sanitation Justice	5
SOCY 177E	Eco-Metropolis: Research Seminar in Urban and Environmental Studies	5
SOCY 179	Nature, Poverty, and Progress: Dilemmas of Development and Environment	5
SOCY 185	Environmental Inequality	5

UCDC

See the UCDC program for more information. Courses need to be approved directly through the Environmental Studies Department following the procedures for **non-approved courses**.

Latin American and Latino Studies

32 Merrill Academic Building
(831) 459-4284

PROGRAMS OFFERED

Latin American and Latino Studies B.A. (p. 664)

Latin American and Latino Studies/Politics Combined Major (p. 669)

Latin American and Latino Studies/Sociology Combined Major (p. 672)

Latin American and Latino Studies Minor (p. 675)

Latin American and Latino Studies Ph.D. (p. 676)

Latin American and Latino Studies Designated Emphasis (p. 678)

LALS is the combination of Latin American studies and Latina/o/x studies. LALS is grounded on the understanding that U.S. Latina/o/x, Chicana/o/x and Latin American peoples, subjects, histories and processes are

interrelated. It is an area of study that draws from disciplines and fields. Our disciplines include sociology, history, anthropology, political science, economics, environmental studies, and literature. Our fields include ethnic studies, migration studies, environmental studies, media studies, communications, cultural studies, feminist studies, and health studies. Our focus is across the Américas, and our mission is driven by a deep commitment to activist scholarship, engaged teaching, and social justice.

UNDERGRADUATE PROGRAM

The Latin American and Latino studies (LALS) Department prepares students to be active global citizens, engaged in rigorous educational study with "real world" applications. Our students become committed scholars who want to better understand the roots of major issues like inequality, rights, oppression, globalization, and migration—and to learn about effective strategies for addressing them through a variety of fields and disciplines. Our students take seriously the importance of understanding others from a variety of perspectives, and engaging peoples and ideas through several languages including English, Spanish, and Portuguese. LALS students learn about the historical, economic, social, political, and cultural processes that are shaping and transforming the Américas. Our majors graduate with a commitment to social change with tools to help make our world a just place for all.

LALS is for students interested in better understanding the Américas. It is for students who 1) want to learn from multiple perspectives and work directly with faculty; 2) are interested in ethnic studies, Latin America, human rights, and social change; and, 3) want to know about the roles various countries, peoples, and cultures have played in shaping Latina/o/x and Latin America today. LALS students have the opportunity to take major courses in Spanish, English, and Portuguese. Our majors study topics, concepts, and theories grounded in the Américas to learn about local, regional, global, and transnational dimensions shaping our world. LALS students often become involved in local communities, in Santa Cruz County, and in their hometowns. They strive to build the community resources and opportunities that help everyone thrive.

LALS is for students who want flexibility in pursuing educational opportunities within their degree coursework. The interdisciplinary structure of our major encourages students to explore many different kinds of courses, opportunities, and programs. Many of our students combine their study with other majors in the social sciences, humanities, arts, and sciences. LALS also encourages transfer students and works closely with them to ensure their success in the major. There are no specific high school-level courses required for admission to the major in LALS at UCSC, but we encourage you to embrace as much language preparation as possible.

LALS students learn about individual countries of the Américas; about historical and contemporary issues,

processes, and cultures; about migration, transnationalism, intersectionality, inequality, collective action, social movements, power and culture; and about strategies and solutions for addressing questions of rights, advocacy, and justice. LALS students investigate the historical, political, economic, social, and cultural processes that are shaping and transforming the Américas region. By viewing societies as interrelated—specifically U.S. Latino/a communities and Latin American/Caribbean communities—LALS students learn to analyze from multiple perspectives, to understand imperialism and colonialism, and to clarify local, regional, global, and transnational dimensions affecting the histories, politics, and cultures of the hemisphere.

In addition to academic knowledge, LALS supports and encourages students to pursue opportunities to acquire practical skills. Through internships and field study experiences, students can acquire useful, pre-professional skills in key areas, such as political advocacy, community development, public policy, education, legal services, and research.

Graduates of the LALS major have forged careers in a wide variety of fields, including environmental activism, community organizing, teaching, health care, legal services, politics and government service, and journalism. Many have gone on to pursue advanced degrees in the U.S. or abroad in fields such as law, anthropology, bilingual education, media, communications, cultural studies, ecology, economics, geography, history, literature, educational counseling, public health, and sociology. LALS majors graduate with knowledge, skills, and understandings that propel them forward into exciting careers grounded in justice, rights, and creating social change.

GRADUATE PROGRAM

The Ph.D. program in Latin American and Latino Studies at UC Santa Cruz offers an innovative transnational and interdisciplinary approach to the study of the peoples, cultures, societies and institutions of the Américas. The program is designed to educate students in this new field of study and train them to develop the conceptual and analytical skills necessary for understanding the dynamics of hemispheric change. This is the first doctoral program in Latin American and Latino Studies. In preparing students for research and teaching at the university level, the department offers four thematic clusters in the emerging field of Latin American and Latino studies: 1) transnational migrations within the Américas; 2) social inequalities; 3) cultural politics and cultural flows; and 4) collective action and social movements. Doctoral students specialize in one of these four substantive themes, as well as a focus area of their own design.

1. **Transnationalisms, Migrations, and Displacement.** While transnational migrations are the subject of research in multiple disciplines, this program analyzes these transformative processes through an interdisciplinary lens. A transnational approach examines links between regions in the

Américas, analyzing the social and historical foundations of economic dynamics such as remittances from the United States or the dollarization of Latin American countries. A transnational approach to the study of migratory processes explores the dynamics of bi-national communities, bilingualism and multilingualism, immigrant integration into host societies, and North-South exchanges of ideas and cultures.

2. **Intersectionality, Identities, and Inequalities.** This program's research in the Américas foregrounds the study of transnational social inequalities formed by power relations based on race, ethnicity, nationality, citizenship, class, territory, gender and/or sexuality. These social hierarchies are analyzed as institutions, historical processes, discourses, or symbols with multiple meanings, and are examined in terms of how they have been mobilized to build, transform, or challenge identities, communities, and social movements in local, national, and global contexts over time.
3. **Cultural, Power, and Knowledge.** Another distinctive area of inquiry in the Américas is the study of cultural politics and cultural flows that shape everyday life, institutions, social identities, discourses, meanings, and cultural forms and practices, in global, regional, and local contexts in an increasingly interconnected and integrated world. The transnational analysis of culture focuses on the ways in which cultural forces and cross-cultural communication and media are contributing to the formation of new transnational imaginaries, as well as how these cultural processes are transforming and redefining national and local cultures.
4. **Collective Action, Social Movements, and Social Change.** This area of research addresses collective action and social movements at local, national and international levels viewed through transnational lenses. As migrants engage in public life, both in their communities of residence and in their communities of origin, they construct diverse practices of political participation, including "civic bi-nationality." These processes are crucial for understanding the largest wave of immigration in a century, including how migrants relate to U.S. society.

The doctoral program provides rigorous training in both disciplinary and interdisciplinary approaches to the study of transnational processes that link the Americas. The program educates doctoral students in the theories and research methods based in disciplines of the social sciences and the humanities.

LATIN AMERICAN AND

LATINO STUDIES B.A.

Information and Policies

Introduction

A degree in Latin American and Latino studies (LALS) trains students to be critical and analytical thinkers, to be active, engaged global citizens, and to be skilled strategic activists in making the world a more just place for all. An LALS bachelor of arts (B.A.) prepares students to learn from and work with people from a variety of cultures and perspectives, to understand the complexity of our current political, social, and cultural moment, and to use skills from many disciplines and fields.

Academic Advising for the Program

Advising information for new and continuing students is available on the LALS Advising website, as well as information on how to make an appointment with an advisor through Slug Success. You may also contact us with advising and academic program-related questions at lalsadvising@ucsc.edu. We look forward to hearing from you.

LALS Undergraduate Program
32 Merrill Academic Building
(831) 459-2119
lalsadvising@ucsc.edu

Getting Started in the Major

Students interested in the LALS B.A. are encouraged to enroll in LALS 1: Introduction to Latin American and Latino Studies, at their earliest opportunity.

Program Learning Outcomes

All students completing a degree in Latin American and Latino Studies will have proficiency or competency in the following five areas: critical thinking, research methods, communication, language, and lifelong learning skills.

1. **Critical Thinking.** Ability to analyze from a transnational/transborder/translocal perspective—to see the interconnections between Latin American and Latino issues, people, ideas, problems, and solutions. This includes key skills, such as understanding sources, comparing arguments, analysis, and historical perspective.
2. **Research Methods.** Working knowledge of social scientific and/or humanistic approaches to LALS relevant topics. This includes acquiring qualitative and quantitative skills, gathering or obtaining research data, finding/using primary sources, and other research methods.
3. **Communication.** Key communication skills, including written, oral presentation, and digital, including an understanding of media sources and ability to apply media literacy to cross-cultural analysis.
4. **Language.** Fluency in Spanish and/or Portuguese, in addition to English.
5. **Lifelong Learning Skills.** Acquisition of practical hands-on skills in community engagement, cross-cultural fluency, familiarity with Latin America, and familiarity with Latino experience acquired through experiential learning while working with community and civic organizations.

Major Qualification Policy and Declaration Process

Major Qualification

To declare an LALS major, students must successfully complete any one LALS course with a grade of C or better, and must have or plan to acquire proficiency in Spanish and/or Portuguese by the senior year (sufficient to take LALS courses taught in one or both of these languages). For an overview of the program, students are encouraged to choose LALS 1: Introduction to Latin American and Latino Studies, as their first course.

Students should submit a petition to declare as soon as they complete an LALS course or reach their declaration deadline quarter, whichever comes first.

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed major qualification courses.

Appeal Process

Students who do not satisfy the major declaration requirement but believe there are extenuating circumstances may file a written appeal. Appeals should be submitted to undergraduate advising by emailing: lalsadvising@ucsc.edu. Students must file the appeal within 15 days of denial of major declaration. The department will notify the student and college of the decision within 15 days of the receipt of the appeal.

How to Declare a Major

Students may declare online, via the form on our department website, or in person, in the LALS Advising Office in Merrill Academic Building.

Transfer Information and Policy

Latin American and Latino Studies (LALS) welcomes transfer students. Students planning to apply in this major are not required to complete specific major preparation courses for consideration of admission to UC Santa Cruz.

Transfer Admission Screening Policy

Students interested in transferring to UC Santa Cruz as an LALS major are encouraged to enroll in courses related to the discipline prior to transfer, and to check with the

LALS advisor about using a transfer course toward the lower-division elective requirement when possible.

Getting Started at UCSC as a Transfer Student

Transfer students should enroll in LALS 1: Introduction to Latin American and Latino Studies. LALS 1 is offered in fall and winter quarters and during summer session. To make timely progress in the major, transfer students entering in the fall quarter should also enroll in the first course in our core series, LALS 100: Concepts and Theories in Latin American and Latino Studies; students entering in winter quarter should seek a permission number to enroll in LALS 100A, Social Science Analytics.

Letter Grade Policy

The program does not have a letter grade policy. Major and minor requirements will be met with grades of C or better or Pass, within the parameters of the UC Santa Cruz Pass/No Pass grading policy.

[Optional Catchall]

Course Substitution Policy

Students may substitute two courses taken outside of LALS when satisfying the requirements for the major. Students may use courses from our list of pre-approved electives, or see the undergraduate advisor to petition a new course.

Students studying abroad may substitute a maximum of three courses (including their study abroad coursework) from outside LALS.

Transfer students who have completed LALS-related work prior to transfer should contact the LALS advisor to ask about transfer credit.

No substitutions are permitted for our core curriculum: LALS 1, LALS 100, LALS 100A, and LALS 100B. See the undergraduate advisor for more information.

Double Majors and Major Minor Combinations Policy

Study Abroad

Students may study abroad through UC Santa Cruz faculty-led programs, the University of California Education Abroad Program (UCEAP), other UC study abroad programs, or through non-UC programs. UCEAP offers opportunities for students to study in Buenos Aires, Argentina; Mexico City and Oaxaca, México; Villarrica and Santiago, Chile; Rio de Janeiro, Brazil; and Madrid, Córdoba, Granada, and Barcelona in Spain. In addition to language and culture and university immersion programs, UCEAP also offers a field research program in México, which is an experiential program geared toward juniors and seniors who want to explore the “real” México outside the classroom and at the same time receive undergraduate research training. The program has research sites in states such as Chiapas, Yucatán, Oaxaca,

and Michoacán (final site choice depends on the research topic). There is also a leadership in social justice and public policy, México City and Sacramento program; students study abroad in the capital of México and then add a related internship in Sacramento.

Application deadlines are generally about one year in advance of the program, so students should visit global engagement early to plan for study abroad and to begin the application process. The department will consider by petition the approval of courses taken abroad that cover topics appropriate to the LALS curriculum for credit toward the major. All credit for UCEAP classes is fully incorporated into students' UCSC transcripts; students receive transfer credit for independent study abroad programs. Financial aid may apply to all study abroad programs, which take into account airfare and living costs in addition to tuition and fees. Before departure, students should present an academic plan for courses abroad to the department advisor for review. Credit for up to three study abroad courses may be applied toward the major when courses are approved by the department. (A maximum of three courses of field study and study abroad combined may be applied toward the major requirements.)

Honors

The LALS faculty considers awarding honors in the major based on overall student academic performance in courses that count toward the major. To receive the strongest consideration for honors in the major the following grade point average (GPA) criteria must be met: highest honors, 4.0; honors, 3.7. Students with a 3.5–3.7 GPA in the major will also be considered, and a decision is made based on their grades in core courses and improvement over time.

In addition to honors in the major, LALS may award honors for a thesis, or creative or community action project, or student-taught seminar, by the recommendation of the faculty advisor.

Students may qualify for both honors in the major and honors for a thesis, project, or student-taught seminar. Expanded papers and senior seminars do not qualify for a separate honors designation, but students who choose these options may still qualify for honors in the major.

Field-Study and Internship Opportunities

All majors are encouraged to undertake a field study in Latin America, the Caribbean, or a Latino/a community in the U.S., and/or formal academic study abroad. These paths are the best ways to improve language skills, explore the nature and direction of specific academic and career interests in relation to Latin American and Latino studies, and deepen cross-cultural understanding and relationships.

Field studies are independent, community-based study projects for academic credit, done under faculty sponsorship and arranged on an individual basis. Local

opportunities for internships and field study in Latino/a communities on California's Central Coast are numerous. Credit for up to three upper-division courses may be applied toward the major from field study; however, course credit from field study and study abroad combined may not exceed three upper-division courses. Students should check with the LALS undergraduate advisor for further information about internship and field study opportunities.

[Optional Catchall]

Requirements and Planners

Course Requirements

The LALS B.A. major requires 11 courses: two lower-division courses, three upper-division core courses, and six upper-division electives. Students may use a senior exit requirement course as one of their upper-division electives, and two of the required electives must be taught in Spanish or Portuguese.

Lower-Division Requirements

Two Lower-Division Courses

All students are required to take LALS 1: Introduction to Latin American and Latino Studies, and one additional lower-division LALS course. These courses are normally taken during the student's first year.

Language Preparation

In preparation for completing academic work in Spanish or Portuguese, students are expected to become proficient in either or both languages. Students may need to complete language-instruction courses (through SPAN 6 or SPHS 6 or PORT 65B) to be ready to take courses in Spanish or Portuguese.

Spanish Placement: take the online assessment; if you are a fluent heritage speaker, see the guidelines for self-placement.

Portuguese Placement: enroll in PORT 1, Introduction to Portuguese, or for enrollment in a more advanced level see the placement guidelines.

We want to emphasize that students are **not required** to take language instruction courses. Students are responsible for placing themselves in LALS courses taught in Spanish and Portuguese. Other departments on campus may use language placement prerequisites for their courses, which you can review in the catalog (p. **Error! Bookmark not defined.**) or in the searchable schedule of classes.

Contact the LALS undergraduate program coordinator for more information.

Upper-Division Requirements

Three Upper-Division LALS Core Courses

All majors must complete the three core courses, which aim to build students' intellectual foundation in the major concepts of Latin American and Latino studies (LALS), identify multiple social scientific approaches to LALS, introduce the fundamentals of research design, and prepare students to use this knowledge in further academic study and real world interventions.

LALS 100	Concepts and Theories in Latin American and Latina/o Studies	5
LALS 100A	Social Science Analytics	5
LALS 100B	Cultural Theory in the Americas	5

Six Additional LALS Electives

Of the required electives, two must be courses conducted in Spanish or Portuguese. Students can fulfill this language requirement by taking courses offered by the Latin American and Latino Studies Department, other units at UC Santa Cruz, or while participating in a study abroad program.

One LALS elective may be satisfied by completing a senior seminar (LALS 194 courses).

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division disciplinary communication (DC) requirement. The DC requirement for the Latin American and Latino Studies B.A. is met by completing:

LALS 100A	Social Science Analytics	5
LALS 100B	Cultural Theory in the Americas	5

Comprehensive Requirement

Each student must complete a senior comprehensive requirement to graduate. The preparation and completion of this requirement is structured into the senior year, and the requirement is fulfilled by one of the following four options:

1. Passing a Latin American and Latino studies senior seminar (LALS 194 courses). In these courses, students must write at least 30 pages cumulatively during the quarter. The final paper must be based on independent scholarly research, demonstrate advanced skills in critical analysis, and have undergone revisions. Senior standing and completion of LALS 100A and LALS 100B are required before taking a LALS 194 course for fulfillment of the senior exit requirement.
2. An expanded research paper, a minimum of 20 pages in length. This paper often builds on related course work and requires approval from the relevant faculty advisor before the end of the winter quarter of the senior year. Students must be

- enrolled in an independent study tutorial to complete this paper.
3. A senior thesis, generally between 40–60 pages, based on two or more quarters of sustained independent research under the supervision of the faculty advisor while enrolled in an independent study (done by petition to LALS, and with the approval of the faculty advisor). If the thesis option is selected by a combined major, it should be planned in consultation with an advisor from each department, completed under the supervision of a faculty member from either department, and read and approved by both advisors; one advisor is sufficient if this faculty member is affiliated with both departments. This option is recommended for those students seeking to enter graduate school.
 4. A senior project, which can be either a creative project or a community-action project. Creative projects include website design, video, performance, slide show, photo exhibit, or other media work. A short written analysis of the student’s experience in conducting the project is required. Community-action projects often involve sustained research and/or activity conducted in a community organization or public interest group, usually stemming from an internship. The required written analysis should be 10 pages minimum.

division elective	upper-division elective	upper-division elective
LALS language elective	LALS language elective	LALS 194

4th (sr) Study abroad, research, or additional major or minor

*Course satisfies the ER general education requirement.
 **Native speakers can substitute Spanish for Heritage Speaker series, SPHS 4, SPHS 5, and SPHS 6.

Two-Year Sample Planner for Transfer Students

Recommended academic plan for students starting as juniors and who place into Spanish 4 on the language placement exam.

	Fall	Winter	Spring
1st (jr)	LALS 1*	LALS 100A	LALS 100B
	LALS 100*	LALS upper-division elective	LALS upper-division elective
	SPAN 4** (PORT 65A)	SPAN 5** (PORT 65B)	SPAN 6**
2nd (sr)	LALS upper-division elective	LALS language elective	LALS 194
	LALS language elective		

*Course satisfies the ER general education requirement.
 **Native speakers can substitute Spanish for Heritage Speaker series, SPHS 4, SPHS 5, and SPHS 6.

Two-Year Sample Planner for Transfer Students Planning Study Abroad

Recommended academic plan for students starting as juniors and who place into Spanish 4 on the language placement exam and plan to study abroad.

Planners

Recommended academic plan for students starting as freshmen who place in to SPAN 1 on the language placement exam. Portuguese language track in parentheses for students who choose this option.

Four-Year Sample Planner for Frosh Students

	Fall	Winter	Spring
1st (frosh)	LALS 1*	SPAN 2 (PORT 2)	LALS lower-division elective
	SPAN 1 (PORT 1)		SPAN 3 (PORT 3)
2nd (soph)	LALS 100*	LALS 100A	LALS 100B
	SPAN 4** (PORT 65A)	SPAN 5** (PORT 65B)	SPAN 6**
3rd (jr)	LALS upper-	LALS	LALS

	Fall	Winter	Spring
1st (jr)	LALS 1*	LALS 100A	LALS 100B
	LALS 100*	LALS upper- division elective	LALS upper- division elective
	SPAN 4** (PORT 65A)	SPAN 5** (PORT 65B)	SPAN 6**
2nd (sr)	Study abroad	LALS language elective	LALS 194
		LALS upper- division elective	LALS language elective

*Course satisfies the ER general education requirement.

**Native speakers can substitute Spanish for Heritage Speaker series, SPHS 4, SPHS 5, and SPHS 6.

LATIN AMERICAN AND LATINO STUDIES/POLITICS COMBINED B.A.

Information and Policies

Introduction

A combined degree in Latin American and Latino studies (LALS) and politics allows students to focus on the methods and theories of the discipline of political science within the broader interdisciplinary perspective of LALS.

Academic Advising for the Program

LALS Undergraduate Advising
32 Merrill Academic Building
(831) 459-2119
lalsadvising@ucsc.edu

Politics Undergraduate Advising
25 Merrill Academic Building
(831) 459-2505
gdiaz5@ucsc.edu

Advising for the combined major in LALS and politics is available from both advising offices, though the major is housed in the LALS Department.

Getting Started in the Major

Students interested in the combined major in LALS and politics are encouraged to enroll in LALS 1 and one lower-division politics course, chosen from POLI courses 1-70, at their earliest opportunity.

Program Learning Outcomes

Latin American and Latino Studies Program Learning Outcomes:

We expect that all graduating LALS seniors will have gained proficiency or competency in the following five areas: critical thinking, research methods, communication, language, and lifelong learning skills.

1. **Critical Thinking.** Ability to analyze from a transnational/transborder/translocal perspective—to see the interconnections between Latin American and Latino issues, people, ideas, problems and solutions. This includes key skills, such as understanding sources, comparing arguments, analysis, and historical perspective.
2. **Research Methods.** Working knowledge of social scientific and/or humanistic approaches to LALS relevant topics. This includes acquiring qualitative and quantitative skills, gathering or obtaining research data, finding/using primary sources, and other research methods.
3. **Communication.** Key communication skills, including written, oral presentation, and digital, including an understanding of media sources and ability to apply media literacy to cross-cultural analysis.
4. **Language.** Fluency in Spanish and/or Portuguese, in addition to English.
5. **Lifelong Learning Skills.** Acquisition of practical hands-on skills in community engagement, cross-cultural fluency, familiarity with Latin America, and familiarity with Latino experience acquired through experiential learning, and working with community and civic organizations.

Politics Program Learning Outcomes:

Upon completion of the major, students will have met the following objectives:

1. Understand the origins, development, and nature of political institutions, practices, and ideas;
2. Place particular political phenomena in broader context (national, historical, cross-cultural, and theoretical, etc);
3. Demonstrate familiarity with various theoretical approaches to the study of politics, and their application in different geographic and substantive areas;
4. Critically evaluate arguments about political institutions, practices, and ideas based on logic and evidence;
5. Develop and sustain coherent written and oral arguments regarding political phenomena, theories, and values based on appropriate empirical and/or textual evidence and logic.

Major Qualification Policy and Declaration Process

Major Qualification

Students must complete a lower-division politics course, chosen from POLI 1-70, and LALS 1, with a grade of C or better, and both departments must approve a study plan before the major can be declared.

Students should submit a petition to declare as soon as they complete the required courses or reach their declaration deadline quarter, whichever comes first.

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed major qualification courses.

LALS 1	Introduction to Latin American and Latino Studies	5
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Appeal Process

Students who did not satisfy the major declaration requirement but believe there are extenuating circumstances may file a written appeal. Appeals should be submitted to undergraduate advising by emailing: lalsadvising@ucsc.edu. Students must file the appeal within 15 days of denial of major declaration. The department will notify the student and college of the decision within 15 days of the receipt of the appeal.

How to Declare a Major

Students may declare online, via the form on our department website, or in person, in the LALS Advising Office in Merrill Academic Building.

Transfer Information and Policy

Students planning to apply in this major are not required to complete specific major preparation courses for consideration of admission to UC Santa Cruz.

Transfer Admission Screening Policy

Students interested in transferring to UCSC as an LALS and politics combined major are encouraged to enroll in courses related to both disciplines prior to transfer, and to check with the politics advisor to ask about using transfer credit to satisfy the lower-division politics requirement.

Getting Started at UCSC as a Transfer Student

Transfer students must complete LALS 1 and one politics course, chosen from POLI 1-70 (or equivalent transfer credit), to declare the combined major in LALS and politics. LALS 1 is offered in fall and winter quarters and during summer session. To make timely progress in the major, transfer students entering in fall quarter should also enroll in LALS 100: Concepts and Theories in Latin

American and Latino Studies; transfer students entering in winter quarter should enroll in LALS 100A: Social Science Analytics.

Letter Grade Policy

The program does not have a letter grade policy. Major and minor requirements will be met with grades of C or better or Pass, within the parameters of the UC Santa Cruz Pass/No Pass grading policy.

[Optional Catchall]

Course Substitution Policy

Double Majors and Major Minor Combinations Policy

Study Abroad

Honors

For combined majors, academic performance must meet the criteria in both departments to be awarded honors. Honors can only be conferred if both departments agree.

For LALS, honors are awarded based on performance in courses taken for the major. To receive the strongest consideration for honors in LALS, the following grade point average (GPA) criteria must be met: highest honors, 4.0; honors, 3.7.

For politics, honors are awarded to graduating seniors whose academic performance is judged to be consistently excellent by a committee of politics faculty, based primarily on a review of grades. Highest honors in the major are reserved for students with consistently outstanding academic performance.

[Optional Catchall]

Requirements and Planners

Course Requirements

A total of 12 courses is required for the LALS and politics combined B.A., in addition to any language preparation needed.

Lower-Division Requirements

For the combined major, students must complete two lower-division courses: LALS 1 (must be taken at UCSC) and one course from politics, chosen from POLI 1-70 (may be satisfied with approved transfer course).

LALS 1	Introduction to Latin American and Latino Studies	5
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Language Preparation

In preparation for completing academic work in Spanish or Portuguese, students are expected to become proficient in either or both languages. Students may need to complete language-instruction courses (through SPAN 6

or SPHS 6 or PORT 65B) to be ready to take courses in Spanish or Portuguese.

Spanish Placement: take the online assessment; if you are a fluent heritage speaker, see the guidelines for self-placement.

Portuguese Placement: enroll in PORT 1, Intro to Portuguese, or for enrollment in a more advanced level see the placement guidelines.

We want to emphasize that students are *not required* to take language instruction courses. Students are responsible for placing themselves in LALS courses taught in Spanish and Portuguese. Other departments on campus may use language placement prerequisites for their courses, which you can review in the catalog or in the searchable schedule of classes.

Contact the LALS Undergraduate Program coordinator for more information.

Upper-Division Requirements

LALS 100	Concepts and Theories in Latin American and Latina/o Studies	5
LALS 100A	Social Science Analytics	5
LALS 100B	Cultural Theory in the Americas	5
POLI 140C	Latin American Politics	5

Six Upper-Division Electives

Four from Politics

Three chosen from these options:

POLI 105A	Ancient Political Thought	5
POLI 105B	Early Modern Political Thought	5
POLI 105C	Modern Political Thought	5
POLI 120A	Congress, President, and the Court in American Politics	5
POLI 120B	Society and Democracy in American Political Development	5
POLI 120C	State and Capitalism in American Political Development	5
POLI 140A	European Politics	5
POLI 140D	Politics of East Asia	5
POLI 160A	Theories of International and World Politics	5
POLI 160B	International Law	5
POLI 160C	Security, Conflict, Violence, War	5
POLI 160D	International Political Economy	5

Two from LALS

One elective must be taught in Spanish or Portuguese.

One LALS elective may be satisfied by completing a senior seminar (LALS 194 series).

Disciplinary Communication (DC) Requirement

Students of every major must satisfy a disciplinary communication (DC) requirement. The DC requirement for the LALS and politics combined B.A. is met by completing:

LALS 100A	Social Science Analytics	5
LALS 100B	Cultural Theory in the Americas	5

Comprehensive Requirement

To complete the senior comprehensive requirement, students may take either a Politics (190 series) or LALS (194 series) senior seminar. Students who choose the LALS senior seminar option may use the course as one of their required upper-division electives.

Planners

Recommended academic plan for students starting as freshmen who place in to SPAN 1 on the language placement exam. Portuguese language track in parentheses for students who choose this option.

Four-Year Sample Course Planner for Frosh Students

	Fall	Winter	Spring
1st (frosh)	LALS 1 (ER)	POLI lower-division elective	SPAN 3 (PORT 3)
	SPAN 1 (PORT 1)	SPAN 2 (PORT 2)	
2nd (soph)	LALS 100 (ER)	LALS 100A	LALS 100B
	SPAN 4(PORT 65A)	SPAN 5(PORT 65B)	SPAN 6
3rd (junior)	POLI upper-division core	POLI 140C	POLI upper-division core
	LALS language elective	POLI upper-division core	POLI upper-division elective
4th (senior)	LALS 194*	Study abroad or research	Study abroad or research

*Students have the option to take POLI 190 and another upper-division LALS elective; see advisors for more information.

Two-Year Sample Course Planner for Transfer Students

Recommended academic plan for students starting as juniors and who place into SPAN 4 on the language placement exam.

	Fall	Winter	Spring
1st (junior)	LALS 1 (ER)	LALS 100A	LALS 100B
	LALS 100 (ER)	POLI 140C	POLI upper- division core
	SPAN 4 (PORT 65A)	SPAN 5 (PORT 65B)	SPAN 6
2nd (senior)	POLI upper- division core	POLI upper- division core	POLI upper- division elective
	LALS language elective		LALS 194*

*Students have the option to take POLI 190 and another upper-division LALS elective; see advisors for more information.

LATIN AMERICAN AND LATINO STUDIES/SOCIOLOGY COMBINED B.A.

Information and Policies

Introduction

A combined degree in Latin American and Latino studies (LALS) and sociology allows students to focus on the methods and theories of the discipline of sociology within the broader interdisciplinary perspective of LALS.

Academic Advising for the Program

LALS Undergraduate Advising
32 Merrill Academic Building
(831) 459-2119
lalsadvising@ucsc.edu

Sociology Undergraduate Advising
Rachel Carson College Rm 224/226
831-459-4497
socy@ucsc.edu

Advising for the combined major in LALS and sociology is available from both advising offices, though the major is housed in the LALS Department.

Getting Started in the Major

Students interested in the combined major in LALS and sociology are encouraged to enroll in LALS 1, and the two required lower-division sociology courses, chosen from SOCY 1, SOCY 10, or SOCY 15, at their earliest opportunity.

Program Learning Outcomes

LALS Program Learning Outcomes:

We expect that all graduating LALS seniors will have gained proficiency or competency in the following five areas: critical thinking, research methods, communication, language, and lifelong learning skills.

1. **Critical Thinking.** Ability to analyze from a transnational/transborder/translocal perspective—to see the interconnections between Latin American and Latino issues, people, ideas, problems and solutions. This includes key skills, such as understanding sources, comparing arguments, analysis, and historical perspective.
2. **Research Methods.** Working knowledge of social scientific and/or humanistic approaches to LALS relevant topics. This includes acquiring qualitative and quantitative skills, gathering or obtaining research data, finding/using primary sources, and other research methods.
3. **Communication.** Key communication skills, including written, oral presentation, and digital, including an understanding of media sources and ability to apply media literacy to cross-cultural analysis.
4. **Language.** Fluency in Spanish and/or Portuguese, in addition to English.
5. **Lifelong Learning Skills.** Acquisition of practical hands-on skills in community engagement, cross-cultural fluency, familiarity with Latin America, and familiarity with Latino experience acquired through experiential learning while working with community and civic organizations.

Sociology Program Learning Outcomes:

Students graduating with a bachelor of arts degree in sociology will:

Demonstrate critical thinking and critical citizenship skills intended to promote social justice through the ability to analyze and evaluate social, political, and/or cultural arguments.

Demonstrate sociological understandings of phenomena, for example, how individual biographies are shaped by social structures, social institutions, cultural practices, and multiple axes of difference and/or inequality.

Formulate effective and convincing written and/or oral arguments.

Demonstrate an understanding of, and the ability to use, several of the major classical and/or contemporary perspectives in social theory.

Demonstrate an understanding of several of the major social science research methodologies.

Demonstrate knowledge of some of the key substantive areas within the field of sociology.

Major Qualification Policy and Declaration Process

Major Qualification

Students must complete the lower-division sociology courses (two chosen from SOCY 1, SOCY 10, or SOCY 15) and LALS 1 with grades of C or better or Pass, and both departments must approve a study plan before the major can be declared.

Students should submit a petition to declare as soon as they complete the required courses or reach their declaration deadline quarter, whichever comes first.

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed major qualification courses.

LALS 1	Introduction to Latin American and Latino Studies	5
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Plus two courses chosen from:

SOCY 1	Introduction to Sociology	5
SOCY 10	Issues and Problems in American Society	5
SOCY 15	World Society	5

Appeal Process

Students who did not satisfy the major declaration requirement but believe there are extenuating circumstances may file a written appeal. Appeals should be submitted to undergraduate advising by emailing: lalsadvising@ucsc.edu. Students must file the appeal within 15 days of denial of major declaration. The department will notify the student and college of the decision within 15 days of the receipt of the appeal.

How to Declare a Major

Students may declare online, via the form on the LALS department website, or in person, in the LALS Advising Office in Merrill Academic Building.

Transfer Information and Policy

Students planning to apply in this major are not required to complete specific major preparation courses for consideration of admission to UC Santa Cruz.

Transfer Admission Screening Policy

Students interested in transferring in to UCSC as a combined LALS and sociology majors are encouraged to enroll in courses related to both disciplines prior to transfer. Visit Assist.org to review transfer articulations.

Getting Started at UCSC as a Transfer Student

Transfer students must complete LALS 1 and two courses chosen from SOCY 1, SOCY 10, or SOCY 15 (or equivalent transfer credit) to declare the combined major in LALS and sociology. LALS 1 is offered in fall and winter quarters and during summer session. To make timely progress in the major, transfer students entering in the fall quarter should enroll in LALS 100: Concepts and Theories in Latin American and Latino Studies; students entering in winter quarter should seek a permission number to enroll in LALS 100A: Social Science Analytics. Sociology course enrollment will be determined by the Sociology Department based on transfer coursework.

Letter Grade Policy

The program does not have a letter grade policy. Major requirements will be met with grades of C or better or Pass, within the parameters of the UC Santa Cruz Pass/No Pass grading policy.

[Optional Catchall]

Course Substitution Policy

Double Majors and Major Minor Combinations Policy

Study Abroad

Honors

For combined majors, academic performance must meet the criteria in both departments to be awarded honors. Honors can only be conferred if both departments agree.

The LALS faculty considers awarding honors in the major based on overall student academic performance in courses that count toward the major. To receive the strongest consideration for honors in the major, the following grade point average (GPA) criteria must be met: highest honors, 4.0; honors, 3.7. Students with a 3.5–3.7 GPA in the major will also be considered, and a decision is made based on their grades in core courses and improvement over time.

In addition to honors in the major, LALS may award honors for a thesis by the recommendation of the faculty advisors in both LALS and sociology.

For sociology, honors are awarded based on the student's cumulative GPA for all courses taken at UC Santa Cruz to satisfy the program's major requirements, excluding the comprehensive requirement. Students with a GPA of 3.75 or above will be considered for honors in the major. Students with a GPA of 3.9 or above will be considered for highest honors in the major. No more than approximately 15 percent of the graduating class will be considered for honors or highest honors in the major. Comprehensive honors is awarded to students who complete the senior thesis option, and their faculty thesis sponsor and one additional reader evaluate the thesis to be of honors quality.

[Optional Catchall]

Requirements and Planners

Course Requirements

A total of 12 courses is required for the LALS and sociology combined B.A., in addition to any language preparation needed.

Lower-Division Requirements

Students must complete three courses: one LALS and two sociology, or their articulated equivalents.

LALS 1	Introduction to Latin American and Latino Studies	5
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And select two from the following three options:

SOCY 1	Introduction to Sociology	5
SOCY 10	Issues and Problems in American Society	5
SOCY 15	World Society	5

Language Preparation

In preparation for completing academic work in Spanish or Portuguese, students are expected to become proficient in either or both languages. Students may need to complete language-instruction courses (through SPAN 6 or SPHS 6 or PORT 65B) to be ready to take courses in Spanish or Portuguese.

Spanish Placement: take the online assessment; if you are a fluent heritage speaker, see the guidelines for self-placement.

Portuguese Placement: enroll in PORT 1, Intro to Portuguese, or for enrollment in a more advanced level see the placement guidelines.

We want to emphasize that students are **not required** to take language instruction courses. Students are responsible for placing themselves in LALS courses taught in Spanish and Portuguese. Other departments on campus may use language placement prerequisites for their courses, which you can review in the catalog (p. **Error! Bookmark not defined.**) or in the searchable schedule of classes.

Contact the LALS undergraduate program coordinator for more information.

Upper-Division Requirements

Upper-division core courses:

LALS 100	Concepts and Theories in Latin American and Latina/o Studies	5
LALS 100A	Social Science Analytics	5
LALS 100B	Cultural Theory in the Americas	5
SOCY 105A	Classical Social Theory	5
SOCY 105B	Contemporary Social Theory	5

Upper-division elective courses:

Four additional upper-division electives are required, two from sociology and two from LALS. LALS and sociology combined majors must take at least one course taught in Spanish or Portuguese.

One LALS elective may be satisfied by completing a senior seminar (LALS 194 series).

Disciplinary Communication (DC) Requirement

Students of every major must satisfy a disciplinary communication (DC) requirement. The DC requirement for the LALS and sociology combined B.A. is met by completing:

LALS 100A	Social Science Analytics	5
LALS 100B	Cultural Theory in the Americas	5

Comprehensive Requirement

Each student must complete a senior comprehensive requirement to graduate. The requirement is fulfilled by one of the following options:

1. Passing a Latin American and Latino studies senior seminar (LALS 194 series). In these courses, students must write at least 30 pages cumulatively during the quarter. The final paper must be based on independent scholarly research, demonstrate advanced skills in critical analysis, and have undergone revisions. Senior standing and completion of LALS 100A and LALS 100B are required before taking a LALS 194 course for fulfillment of the senior exit requirement
2. A senior thesis, generally between 40–60 pages, planned in consultation with an adviser from each department, completed under the supervision of a faculty member from either department, and read and approved by both advisers; one adviser is sufficient if this faculty member is affiliated with both departments. This option is recommended for those students seeking to enter graduate school.

Planners

Recommended academic plan for students starting as freshmen who place in to SPAN 1 on the language placement exam. Portuguese language track in parentheses for students who choose this option.

LALS
language
elective

*Course satisfies the ER general education requirement.

Sample Four-Year Planner for Frosh

	Fall	Winter	Spring
1st (frosh)	LALS 1*	SOCY 10	SOCY 1
	SPAN 1 (PORT 1)	SPAN 2 (PORT 2)	SPAN 3 (PORT 3)
2nd (soph)	LALS 100*	LALS 100A	LALS 100B
	SPAN 4 (PORT 65A)	SPAN 5 (PORT 65B)	SPAN 6
3rd (junior)	SOCY 105A	SOCY 105B	SOCY elective
	LALS language elective	SOCY elective	LALS 194
4th (senior)	Study abroad, research, or additional major or minor		

*Course satisfies the ER general education requirement.

Sample Two-Year Planner for Transfer Students

Recommended academic plan for students starting as juniors, who have completed their lower-division SOCY courses prior to transfer, and who place into SPAN 4 on the language placement exam.

	Fall	Winter	Spring
1st (junior)	LALS 1*	LALS 100A	LALS 100B
	LALS 100*	SOCY 105A	SOCY 105B
	SPAN 4 (PORT 65A)	SPAN 5 (PORT 65B)	SPAN 6
2nd (senior)	SOCY elective	SOCY elective	LALS 194

Sample Two-Year Planner for Transfer Students Planning to Study Abroad

Recommended academic plan for students starting as juniors who want to study abroad, who have completed their lower-division SOCY courses prior to transfer, and who place into SPAN 4 on the language placement exam.

	Fall	Winter	Spring
1st (junior)	LALS 1*	LALS 100A	LALS 100B
	LALS 100*	SOCY 105A	SOCY 105B
	SPAN 4 (PORT 65A)	SPAN 5 (PORT 65B)	SPAN 6
2nd (senior)	Study abroad	SOCY elective	LALS 194
		LALS language elective	SOCY elective

*Course satisfies the ER general education requirement.

LATIN AMERICAN AND LATINO STUDIES MINOR

The minor in Latin American and Latino studies requires seven LALS courses: two lower-division courses and five upper-division courses. Knowledge of Spanish and/or Portuguese is highly recommended, but not required for the minor. Students may use up to two pre-approved elective courses (p. 678) from outside of LALS toward the minor.

Course Requirements

Lower-Division Courses

Any two lower-division LALS courses.

Upper-Division Courses

One course chosen from the three following core courses:

LALS 100	Concepts and Theories in Latin American and Latina/o Studies	5
LALS 100A	Social Science Analytics	5
LALS 100B	Cultural Theory in the Americas	5

Four Upper-Division Electives

Any additional four upper-division courses from LALS.

LATIN AMERICAN AND LATINO STUDIES PH.D.

Introduction

The Ph.D. program in Latin American and Latino Studies at UCSC offers an innovative transnational and interdisciplinary approach to the study of the peoples, cultures, societies and institutions of the Americas. The program is designed to educate students in this new field of study and train them to develop the conceptual and analytical skills necessary for understanding the dynamics of hemispheric change. This is the first doctoral program in Latin American and Latino Studies.

In preparing students for research and teaching at the university level, the department offers four thematic clusters in the emerging field of Latin American and Latino Studies: 1) transnational migrations within the Americas; 2) social inequalities; 3) cultural politics and cultural flows; and 4) collective action and social movements. Doctoral students specialize in one of these four substantive themes, as well as a focus area of their own design.

- **Transnationalisms , Migrations, and Displacement.** While transnational migrations are the subject of research in multiple disciplines, this program analyzes these transformative processes through an interdisciplinary lens. A transnational approach examines links between regions in the Americas, analyzing the social and historical foundations of economic dynamics such as remittances from the United States or the dollarization of Latin American countries. A transnational approach to the study of migratory processes explores the dynamics of bi-national communities, bilingualism and multilingualism, immigrant integration into host societies, and North-South exchanges of ideas and cultures.
- **Intersectionality , Identities, and Inequalities.** This program's research in the Americas foregrounds the study of transnational social inequalities formed by power relations based on race, ethnicity, nationality, citizenship, class, territory, gender and/or sexuality. These social hierarchies are analyzed as institutions, historical processes, discourses, or symbols with multiple meanings, and are examined in terms of how they have been mobilized to build, transform, or challenge identities, communities, and social movements in local, national, and global contexts over time.
- **Cultural, Power, and Knowledge.** Another distinctive area of inquiry in the Americas is the study of cultural politics and cultural flows that shape everyday life, institutions, social identities,

discourses, meanings, and cultural forms and practices, in global, regional, and local contexts in an increasingly interconnected and integrated world. The transnational analysis of culture focuses on the ways in which cultural forces and cross-cultural communication and media are contributing to the formation of new transnational imaginaries, as well as how these cultural processes are transforming and redefining national and local cultures.

- **Collective Action, Social Movements, and Social Change.** This area of research addresses collective action and social movements at local, national and international levels viewed through transnational lenses. As migrants engage in public life, both in their communities of residence and in their communities of origin, they construct diverse practices of political participation, including "civic binationality." These processes are crucial for understanding the largest wave of immigration in a century, including how migrants relate to US society.

The doctoral program provides rigorous training in both disciplinary and interdisciplinary approaches to the study of transnational processes that link the Americas. The program educates doctoral students in the theories and research methods based in disciplines of the social sciences and the humanities.

The deadline for applications to the doctoral program is December 15 in the preceding year. The program only accepts students for admission in fall quarter.

Advancement to Candidacy

Course Requirements

Thirteen Courses

The program requires a total of 13 courses with LALS Graduate Program Affiliated Faculty, including the definition of two areas of concentration. Of the required courses, up to three may be independent studies with LALS faculty. Of the 13 required courses, students may take up to five graduate courses offered in other departments and with approval from the graduate director.

Before advancement to candidacy, a full-time course load is two or three courses at the graduate level.

The following are the course requirements:

LALS 200	Bridging Latin American and Latina/o Studies	5
LALS 200A	Power and Society	5
LALS 200B	Theories of Culture in the Americas	5
LALS 201	Research in Practice	5

Two Methodology Courses Taught in LALS or in

a Disciplinary Department

All graduate students in-residence are required to enroll in the 2-credit LALS Graduate Colloquium every quarter.

Six additional 5-credit courses leading to the definition of two areas of concentration, taken in consultation with the faculty advisor.

If students enroll in a graduate summer language course, the course will not count as part of the six additional required courses.

If a student enters with a master's degree from another university, they may petition to the graduate director to apply some

Foreign Language Requirement

The program requires significant reading, writing and speaking abilities in both English and Spanish.

As per Graduate Division requirements, the secondary language requirement must be satisfied by the end of the third year, prior to Advancing to Candidacy. The secondary language requirement may be fulfilled by:

1. Departmental sit-down, Spanish-to-English translation examination
 - a. UCSC graduate courses in Spanish/Portuguese
 - b. Passing a 5-credit graduate seminar in LALS or other UCSC department, offered in secondary language during the academic year
2. Passing a UCSC Literature Department summer research language course
3. Summer immersion program, e.g. Berkeley, Cornell, or abroad. The program must have a scholarly and rigorous focus, the student must receive advance approval from faculty advisor, and the student must submit to the graduate advisor a letter from the program attesting to their completion of the program and their satisfactory performance in the secondary language. We urge students who choose this option to organize their language training early in their graduate career.
4. Graduating from a university with primary instruction in Spanish/Portuguese.

Students will be required to include information regarding their plans for satisfying the secondary language requirement in their End-of-Year statements in the first and second years.

Students are required to demonstrate, by one of the methods listed above, their proficiency in a language other than English before the completion of the qualifying examination.

Qualifying Examination

Doctoral students will be required to submit two qualifying essays, and a qualifying examination, as described below. A qualifying examination committee, composed of four faculty members, will approve both the scope of the field statements constituting the qualifying essays and the final written products, and conduct the oral examination. This committee must include at least two LALS faculty members (i.e. LALS core faculty and LALS graduate program affiliates), and follow graduate division guidelines. The qualifying examination committee must be approved in advance by the Graduate Division. Students should take their examinations by spring of the third year. The qualifying-examination process is discussed in detail in a meeting with the graduate program coordinator and graduate director as graduate students finish the fall quarter of their second year.

1. **Qualifying Essays.** Students are required to complete two qualifying essays. The qualifying essay topics should address broad non-overlapping fields and review the literatures related to the proposed dissertation questions. Students should consult with their qualifying examination committee early in the process, regarding the appropriate scope and content of their essays.

One of the qualifying essays must focus on one of the department's four themes: transnational migrations and social displacement; intersectionality, identities and inequalities; collective action, social movements and social change; and culture, power, and knowledge. The qualifying essay should demonstrate command of the methodology relevant to the student's specialized research interests (e.g., ethnographic field methods, textual analysis, archival research methods, statistics, media analysis, and/or comparative methods) and include relevant texts in the second language. The committee chair must approve these essays at least one month prior to the oral examination.

In addition, the essays must be accompanied by two proposed course syllabi for potential undergraduate courses.

2. **Qualifying Examination.** An oral examination will follow the approval of the qualifying essays.
3. After successfully completing the qualifying examination, students are expected to assemble a dissertation committee chaired by a LALS principal faculty member chosen from the LALS core or LALS graduate program affiliate faculty lists.
4. Coursework and the qualifying process should be completed by the end of the third year. Students may petition for a non-terminal master's degree after advancing to candidacy.

Dissertation**Dissertation**

Students will be expected to complete the dissertation prospectus and secure approval from the dissertation committee by the last day of the quarter after the qualifying examination. In the prospectus, students should clearly articulate the logic of an interdisciplinary, transnational approach, as well as the methodologies to be used for addressing the research questions.

The dissertation must demonstrate in-depth research, make a significant and original scholarly contribution, and include material worthy of publication.

LATIN AMERICAN AND LATINO STUDIES DESIGNATED EMPHASIS

Introduction

Graduate students may work toward a doctor of philosophy (Ph.D.) degree that notes a designated emphasis in Latin American and Latino studies on the graduation documents. Students wishing to pursue this option should consult with the advisor of their respective Ph.D. programs and are encouraged to apply in the first or second year of graduate study. The application and an annually updated list of regularly offered, approved graduate courses are available on the LALS website.

Requirements

The following are required for the designated emphasis:

Committee Composition and Departmental Approvals

The student must have a designated graduate advisor from among the Latin American and Latino studies core, participating, or affiliated faculty. This advisor will be in addition to the graduate advisor from the student's home department. The Latin American and Latino studies advisor must serve on the student's qualifying examination committee and/or on the student's dissertation committee.

Course Requirements

The student must take five graduate courses in Latin American and Latino studies, including the required following courses:

LALS 200	Bridging Latin American and Latina/o Studies	5
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PRE-APPROVED LALS B.A. ELECTIVES COURSE LIST

Pre-Approved LALS BA Electives**Course Lists****Anthropology**

ANTH 130B	Brazil	5
ANTH 130F	Blackness In Motion: Anthology of the African Diasporas	5
ANTH 130J	Politics and Statemaking in Latin America	5
ANTH 130M	Inside Mexico	5
ANTH 130P	Ethnography of Southern Cone Chile and Argentina	5
ANTH 130U	Central America	5
ANTH 133	Narratives of the Popular	5
ANTH 145X	Special Topics in Socio-Cultural Anthropology	5
ANTH 164	The Anthropology of Dance	5
ANTH 176B	Meso-American Archaeology	5

College Ten

CLTE 135	Apprenticeship in Community Engaged Research	5
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Economics

ECON 148	Latin American Economies	5
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Education

EDUC 128	Immigrants and Education	5
EDUC 141	Bilingualism and Schooling	5
EDUC 181	Race, Class, and Culture in Education	5

Environmental Studies

ENVS 122	Tropical Ecology and Conservation	5
ENVS 143	Sustainable Development: Economy, Policy, and Environment	5
ENVS 145	Green Cities	5
ENVS 154	Amazonian Cultures and Conservation	5

Feminist Studies

FMST 115	Gender, Sexuality, and Transnational Migration Across the Americas	5
FMST 124	Technology, Science, and Race Across the Americas	5
FMST 175	Gender and Sexualities in Latina/o America	5
FMST 194F	Chicana/Latina Cultural Production	5

Film and Digital Media

FILM 165E	Chicana/o Cinema, Video	5
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FILM 168	National Cinema and Culture	5	LIT 189B	El Siglo XIX en America Latina: cultura, política y sociedad	5
History			LIT 189C	Introducción a Spanish Studies	5
HIS 11A	Latin America: Colonial Period	5	LIT 189F	Literaturas Latinas en los Estados Unidos: en inglés, español y Spanglish	5
HIS 11B	Latin America: National Period	5	LIT 189G	Cine y Literatura	5
HIS 12	Introduction to Latino American History	5	LIT 189L	Poesía latinoamericana	5
HIS 128	Chicana/Chicano History	5	LIT 189O	El Cuento Hispanoamericano: Variedades estéticas de la literatura breve en America Latina	5
HIS 130	History of Modern Cuba	5	LIT 189Q	Ficción y marginalidad	5
HIS 131	Women in Colonial Latin America	5	LIT 189S	La cultura popular en la narrativa latinoamericana	5
HIS 134A	Colonial Mexico	5	LIT 189V	Andean Indigenismo	5
HIS 134B	History of Mexico, 1850 to Present	5	LIT 189X	Estudios mediáticos	5
HIS 185I	Latin American Jewish History in the Modern Period	5	LIT 189Z	Literatura de Chile	5
HIS 190A	Slavery and Race in Latin America	5	Music		
HIS 190B	Race and the Nation in Latin America	5	MUSC 12	Mariachi Ensemble	2
HIS 190D	Asian and Latino Immigration Since 1875	5	MUSC 12B	Mexican Folklorico Music and Dance	2
HIS 190T	Latin America in the Cold War	5	MUSC 80F	Music in Latin American Culture: Regional Traditions	5
History of Art and Visual Culture			Oakes College		
HAVC 140D	Chicano/Chicana Art: 1970-Present	5	OAKS 151A	Corre la Voz: Community Literacies and Power Seminar	2
HAVC 144A	Latin American Art and Visual Culture	5	OAKS 151B	Community Literacies Field Study	3
HAVC 160A	Indigenous American Visual Culture Before 1550: Mexico	5	OAKS 153	Community Mapping	5
HAVC 160B	Indigenous American Visual Culture Before 1550: The Andes	5	Politics		
HAVC 162A	Advanced Studies in Early Indigenous American Visual Culture: The Ancient Maya	5	POLI 140C	Latin American Politics	5
HAVC 162B	Advanced Studies in Early Indigenous American Visual Culture: The Inka	5	POLI 144	Andean Politics	5
HAVC 180A	Contemporary Art in a Globalized World	5	POLI 190V	States in the Global South	5
Literature			Psychology		
LIT 61Z	Introducción a generos literarios de Espana y America Latina	5	PSYC 119A	Development as a Sociocultural Process	5
LIT 80N	Latino Expressions in the U.S	5	PSYC 140F	Mind, Society, and Culture	5
LIT 80Q	Jane the Virgin: Latinx Readers and (Latin) American Literature	5	PSYC 144	Latinx Psychology	5
LIT 165B	Latino Fictions of the Americas	5	PSYC 155	Social-Community Psychology in Practice	5
LIT 189A	De la conquista a Sor Juana	5	Sociology		
			SOCY 15	World Society	5
			SOCY 30A	Introduction to Global Information and Social Enterprise Studies	5
			SOCY 107A	Designing ICT Projects for Social Enterprise	5
			SOCY 117M	Immigration Enforcement and Deportations	5
			SOCY 156	U.S. Latinx Identities: Centers and Margins	5

Spanish

SPAN 156A	The Language of Latin America Cinema	5
SPAN 156F	El Humor en Espanol	5
SPAN 156J	Contemporary Central America	5
SPAN 156M	Mexico and the Southwest	5

Spanish for Spanish Speakers

SPHS 115	El ensayo lectura, analisis y redaccion	5
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Theater Arts

THEA 80M	Chicano/a Teatro	5
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Politics

Politics

25 Merrill College
(831) 459-2855
politics@ucsc.edu
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Legal Studies

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PROGRAMS OFFERED

Politics B.A. (p. 680)

Politics Minor (p. 683)

Politics Ph.D. (p. 690)

Politics Designated Emphasis (p. 692)

Legal Studies B.A. (p. 684)

Legal Studies Minor (p. 689)

OTHER PROGRAMS OF INTEREST

Latin American and Latino Studies/Politics Combined Major (p. 669)

The study of politics is the exploration of the ways human communities shape and share a common life through their institutional practices, ideas, interests, and expectations. It looks at the way collective decisions are made, and at the obstacles citizens meet as they try to forge a shared and just life. Courses address issues central to public life, such as democracy, power, freedom, political economy, social movements, international law and conflict, institutional reforms, and how public life, as distinct from private life, is constituted. In describing the department and major at UC Santa Cruz, we use the term 'politics' (rather than 'political science' or 'government') because

the study of political life requires a more inclusive approach than that associated solely with the discipline of political science, and because politics happens in places other than governments.

The programs offered by the UCSC Politics Department are designed to acquaint students with a broad range of issues studied by those in the field. The department offers an undergraduate major, a minor, a combined Latin American and Latino studies/politics major, and a doctoral degree.

The Politics Department also encourages students to pursue additional academic opportunities while at UCSC. Possible programs include: the UCDC Program, a one-quarter program at the UC campus in Washington, D.C. that includes coursework and an internship; UCSAC, a one-quarter program at the center in Sacramento; and the Education Abroad Program (UCEAP).

The Politics Department also administers the Legal Studies Program.

POLITICS B.A.**Information and Policies****Introduction**

The study of politics is a critical part of a liberal arts education. Since political issues and practices are embedded in and reflective of the whole experience of a community, the study of politics can constitute the center of a broad-based course of study drawing on history, sociology, anthropology, philosophy, political science, economics, literature, science, and law.

UC Santa Cruz politics students have many opportunities for field work and for internship placements. Students are encouraged to develop their own extensive independent research projects.

Politics faculty members give students individual attention to help them in their studies. Faculty members are firmly committed to the value of a liberal arts education, but they are also actively engaged in programs of research and writing. The research interests of the faculty range from questions of justice to the problem of war, from campaign strategy to relations between the rich and the poor countries of the world.

No specific courses at the high school level are required for admission to the major in politics at UCSC. Courses in history, literature, philosophy, and the social sciences, whether taken at the high school or college level, are appropriate background and preparation for the politics major.

A major in politics is appropriate for students interested in careers in law, journalism, or teaching; in political and governmental work from local to international settings; in non-governmental organizations; and in corporations dealing with regulatory or global issues. Many UCSC politics graduates have also gone on to do advanced work

in distinguished graduate and professional schools. Others have found active and challenging careers in business and community organizing. Still others have turned to scholarship and writing. But regardless of career direction, the most significant purpose of the politics major is to help educate a reflective and activist citizenry capable of sharing power and responsibility in a contemporary democracy.

Academic Advising for the Program

Undergraduate Advisor

The undergraduate advisor offers specific information about navigating through the program and the curriculum and assists students with prerequisites, requirements, policies, procedures, learning support, guidance on internships, scholarships, and opportunities for undergraduate research. Contact polimajor@ucsc.edu.

Transfer students should also consult the Transfer Information and Policy section

Peer Advisors

Peer advising assists with academic planning, major and minor requirements, preparing declaration paperwork and provides guidance on UCDC program requirements. Contact lgstpoli@ucsc.edu.

Getting Started in the Major

Program Learning Outcomes

Upon completion of the major, students will have met the following objectives:

1. understand the origins, development, and nature of political institutions, practices, and ideas;
2. place particular political phenomena in broader context (national, historical, cross-cultural, and theoretical, etc);
3. demonstrate familiarity with various theoretical approaches to the study of politics, and their application in different geographic and substantive areas;
4. critically evaluate arguments about political institutions, practices, and ideas based on logic and evidence;
5. develop and sustain coherent written and oral arguments regarding political phenomena, theories, and values based on appropriate empirical and/or textual evidence and logic.

Major Qualification Policy and Declaration Process

Major Qualification

Students may declare the major after completing two lower-division politics courses POLI 1–POLI 79 with

grades of C or better. These courses are normally taken during the first year for frosh.

Appeal Process

Students who are approaching the campus declaration deadline and who have not completed two lower-division courses POLI 1–POLI 79, or their transfer equivalents, with grades of C or better may petition to declare the major: the petition will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) to be resolved within at most one more enrolled quarter.

How to Declare a Major

Students who are eligible to declare the major must complete the Politics Academic Planning Form and share it via email with polimajor@ucsc.edu. Declaration of major workshops provide additional information on this process and are offered each quarter.

Transfer Information and Policy

Transfer Admission Screening Policy

No major preparation courses are required prior to transfer; however, one or two of the following courses or their equivalents are recommended to ensure timely graduation.

POLI 1	Politics: Power, Principle, Process, and Policy	5
POLI 3	Keywords: Concepts in Politics	5
POLI 4	Citizenship and Action	5
POLI 17	U.S. and the World Economy	5
POLI 20	American Politics	5
POLI 21	Governing the Golden State	5
POLI 45	Music and Politics in Contemporary Society	5
POLI 46	Africa in Global Perspective	5
POLI 60	Comparative Politics	5
POLI 61	Politics of Social Policy	5
POLI 65	Introduction to International Relations	5
POLI 70	Global Politics	5

Getting Started at UCSC as a Transfer Student

To ensure a smooth transition into UC Santa Cruz and timely completion of the major, transfer students should meet with the politics undergraduate advisor as early as possible to discuss a two-year major planner and course enrollment. Completion of a lower-division politics course in the first quarter will allow timely declaration of the major (required in the second quarter of enrollment).

Letter Grade Policy

This program does not have a letter grade policy.

Course Substitution Policy**Double Majors and Major/Minor Combinations Policy**

The department accepts proposals for double majors. A student pursuing a double major meets the full requirements of the politics major as well as the full requirements of the other major.

The Politics Department offers a combined major with the Latin American and Latino Studies Department. Requirements may be found in the Latin American and Latino studies section of the catalog.

Honors

Students receiving "Honors" and "Highest Honors" in the politics major upon graduation will typically have taken at least 10 major courses for a letter grade and will have achieved in those courses GPAs of 3.7 and 3.85 respectively. Final determinations about honors are made by a faculty committee that judges the rigor, breadth, depth, improvement, and overall achievement evident in the student's academic record in the major.

Independent and Field Studies

Students may petition the department to substitute only one upper-division independent study or field study toward the elective requirement in the politics major. UCDC and UCSAC internships are exempt from this limit.

Requirements and Planners**Course Requirements****Lower-Division Courses****Two lower-division politics courses numbered 1-79**

All students are required to complete and pass two such courses, numbered POLI 1 through POLI 79, as a foundation for continued success in the politics major and as a requirement to declare the major. These courses are normally taken during the student's first year.

Upper-Division Courses**Four upper-division politics core courses.**

The following four groups of courses constitute the core of the politics major. Four courses are required: two courses from one group, one course from a second group, and one course from a third group. In general, upper-division courses are not recommended for frosh.

Theory

POLI 105A	Ancient Political Thought	5
POLI 105B	Early Modern Political Thought	5
POLI 105C	Modern Political Thought	5

POLI 105D	Contemporary Political Theory: Modernity and its Discontents	5
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U.S. Politics

POLI 120A	Congress, President, and the Court in American Politics	5
POLI 120B	Society and Democracy in American Political Development	5
POLI 120C	State and Capitalism in American Political Development	5

Comparative

POLI 140A	European Politics	5
POLI 140C	Latin American Politics	5
POLI 140D	Politics of East Asia	5

Global Politics/International Relations

POLI 160A	Theories of International and World Politics	5
POLI 160B	International Law	5
POLI 160C	Security, Conflict, Violence, War	5
POLI 160D	International Political Economy	5

Four upper-division politics electives

Four courses selected from POLI 101-POLI 190, one of which may satisfy the comprehensive requirement described below (see the "Course Description" page for details about these courses).

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement for politics majors is satisfied by completing any three of the four required core courses. The politics core course list is detailed above in the major requirements.

Comprehensive Requirement

The comprehensive requirement in the Politics Department can be satisfied in any of the following methods:

- **Senior Seminar:** Successful completion of a politics senior seminar (POLI 190 series) that includes the writing of an extensive paper (no less than 15 pages) with a substantial research content. To enroll in a specific POLI 190 seminar, students must have successfully completed the prerequisite courses listed in the seminar's catalog course description.
- **Additional (Fifth and Sixth) Electives:** Successful completion of two additional politics upper-division electives, one of which includes a substantial writing component comparable to a paper for a senior seminar, either as part of the

existing course requirements or added with the approval of the instructor. The student must receive prior approval from the instructor of the course with the substantial writing component, and must enroll in a two-credit independent study, POLI 199F as part of this option. Generally, instructors with the title of lecturer are not available to supervise POLI 199F.

- **Graduate Seminar:** Successful completion of a politics graduate seminar (enrollment is contingent on the written recommendation of two politics faculty) that includes the writing of an extensive paper (no less than 15 pages) with a substantial research content.
- **Thesis (2-3 quarters):** Successful completion of a senior thesis (POLI 195A, POLI 195B, POLI 195C) of a minimum of 50 pages. This option is for students interested in working on original research and writing under the supervision of a politics faculty member.

Planners

A four-year course plan for frosh majoring in politics and a two-year course plan for transfer students are provided below.

Four-Year Sample Course Planner for Frosh Students

Year	Fall	Winter	Spring
1st (frosh)	POLI (Lower-division)	POLI (Lower-division)	
2nd (soph)	POLI (Upper-division elective)	POLI (Upper-division elective)	POLI (Upper-division core)
3rd (junior)	POLI (Upper-division core)	POLI (Upper-division elective)	POLI (Upper-division core)
	POLI (Upper-division elective)	POLI (Upper-division core)	
4th (senior)	POLI 190 (Senior Seminar)		

In addition to the specific courses shown in this four-year planner, a student must complete courses satisfying the general education requirements. While many politics courses that fulfill major requirements also fulfill a GE requirement, which GE requirements are fulfilled by completion of the major depends on which specific courses a student takes to fulfill the major requirements.

Two-Year Sample Course Planner for Transfer Students

Year	Fall	Winter	Spring
1st (junior)	POLI (Lower-division)*	POLI (Upper-division elective)	POLI (Upper-division elective)
	POLI (Lower-division)	POLI (Upper-division core)	POLI (Upper-division core)
	POLI (Upper-division elective)		
2nd (senior)	POLI (Upper-division core)	POLI 190 (Senior Seminar)	
	POLI (Upper-division elective)	POLI (Upper-division core)	

This planner assumes that a student has completed all general education requirements—beyond major preparation requirements before coming to UC Santa Cruz.

*Articulated equivalent courses may be taken prior to transfer.

POLITICS MINOR

Students in our minor gain a solid grounding in ideas, concepts, and real-world problems and possibilities of politics through a selection of at least six courses.

Course Requirements

The minor requires one lower-division politics course and five upper-division politics courses. Of these, four are to be selected from core classes in our subfields: political theory (105 series), American politics (120 series), comparative politics (140 series) and global/international politics (160 series).

Students select two subfields' core series and are required to complete two core classes in each.

The sixth course can be any politics upper-division elective numbered 100-186.

Completion of the minor does not require a senior seminar.

Lower-Division Courses

One lower-division politics course from POLI 1-POLI 79.

POLI 1	Politics: Power, Principle, Process, and Policy	5
POLI 3	Keywords: Concepts in Politics	5
POLI 4	Citizenship and Action	5
POLI 17	U.S. and the World Economy	5
POLI 20	American Politics	5
POLI 21	Governing the Golden State	5
POLI 45	Music and Politics in Contemporary Society	5
POLI 46	Africa in Global Perspective	5
POLI 60	Comparative Politics	5
POLI 61	Politics of Social Policy	5
POLI 65	Introduction to International Relations	5
POLI 70	Global Politics	5

Upper-Division Courses

Five upper-division politics courses are required. Of these, four are to be selected from the core courses listed below: two from one concentration and two from another concentration (Concentrations are: Theory, U.S., Comparative and Global/IR). A fifth course is to be selected from POLI 101-POLI 199.

Theory

POLI 105A	Ancient Political Thought	5
POLI 105B	Early Modern Political Thought	5
POLI 105C	Modern Political Thought	5

U.S. Politics

POLI 120A	Congress, President, and the Court in American Politics	5
POLI 120B	Society and Democracy in American Political Development	5
POLI 120C	State and Capitalism in American Political Development	5

Comparative

POLI 140A	European Politics	5
POLI 140C	Latin American Politics	5
POLI 140D	Politics of East Asia	5

Global Politics/International Relations

POLI 160A	Theories of International and World Politics	5
POLI 160B	International Law	5

POLI 160C	Security, Conflict, Violence, War	5
POLI 160D	International Political Economy	5

LEGAL STUDIES B.A.

Information and Policies

Introduction

Legal Studies (LGST) is an interdisciplinary, liberal arts major focused on legal ideas, institutions, and issues in and beyond the U.S. Our courses introduce students to the integral roles of law in social life, including its complex relation to values and shifting views of justice, rights, liberty, equality, citizenship, and authority; to culture and social practices; and to historical, political, and economic forces and institutions.

Our program is housed under the auspices of the Politics Department, but operates independently and is designed to provide different disciplinary lenses on intersections between law and other realms. These include the relation of law to human rights, civil rights, voting rights, and property rights; to immigration, citizenship, borders, and sovereignty; to racial, gender, and economic inequalities; to environmental and health justice; to the scope and limits of governmental power; to the law of democracy and relation between citizens and the state; to relations between nation-states; and to concerns regarding access to justice, justice gaps, and historical and systemic injustices.

Students who join this major have the opportunity to take courses with faculty from a range of backgrounds in the social sciences, humanities, arts, and law. Our curriculum includes course offerings spanning from anthropology, art, economics, environmental studies, feminist studies, history, Latin American and Latino studies, literature, music, philosophy, politics, psychology, and sociology. This allows our students to engage their interests through different approaches and analytical frameworks, and to consider many dimensions of law and its operation. For example, legal studies students might learn how to use approaches from psychology or philosophy to think about crime and punishment; they might use approaches from political theory or economics to think about property rights or social welfare policies; they might consider civil rights or privacy issues through approaches from critical race theory or feminist studies; they might use approaches from history or sociology to consider law in different eras or in relation to different groups; they might use approaches from politics to consider human rights and legal systems outside the U.S.

The legal studies major provides a broad academic platform from which students can pursue many different career paths and/or advanced studies. Alumni from our program work in many areas: law and the legal profession, government, non-profits, education, health, and community services, technology and software engineering, business, consulting and accounting, the

entertainment industry, media, journalism, and communications. Our alums are also successful in pursuing graduate degrees in many fields. Although legal studies is often of interest to students considering law school or law-related careers, the major is not designed as “pre-law” or preparation for law school. (Students who are considering law school should visit the Career Center's website and pre-law coach.

Our program strongly encourages students to enrich their studies with additional learning and opportunities. Legal Studies sponsors a speakers series and co-sponsors other talks and events, including career and alumni panels. We also encourage students to pursue internships or field experiences, such as through our legal studies internship seminar (LGST 185); Legal Aid & Advocacy (LGST 188A and OAKS 188B/LGST 188B) through the UCDC program, a one-quarter study and internship program in Washington, D.C.; or through the UC Center Sacramento, which offers a one-quarter study and internship program at the state capitol. Students may also want to study abroad through the Education Abroad Program (EAP) at UCSC, and some may want to consider developing independent research projects on topics of special interest to them.

Academic Advising for the Program

Undergraduate Advisor

The undergraduate advisor offers specific information about navigating through the program and the curriculum and assists students with prerequisites, requirements, policies, procedures, learning support, guidance on internships, scholarships, and opportunities for undergraduate research. Please contact the LGST undergraduate advisor at legalstudies@ucsc.edu.

Peer Advisors

Peer advising can assist in academic planning in regards to major and minor requirements and help prepare declaration of major and minor paperwork. Please contact the LGST peer advising team at lgstpoli@ucsc.edu.

Getting Started in the Major

Program Learning Outcomes

Upon completion of the major, students will have achieved the following areas of learning and skills:

- an understanding of the nature and function of law, including legal theory, institutions, and analysis;
- an understanding of the role of law and legal institutions in the broader society, including the social, political, and economic context in which it operates;
- an understanding of the distinct nature of legal institutions and practices from a variety of interdisciplinary perspectives;

- the ability to analyze and critically evaluate arguments about legal theories, practices, and institutions based on logic and evidence, and from a variety of interdisciplinary perspectives; and
- the ability to develop, sustain, and communicate coherent written and oral arguments and analyses regarding legal issues based on appropriate empirical and/or theoretical evidence and logic.

Major Qualification Policy and Declaration Process

Major Qualification

Students may declare the major after completing the following course: LGST 10, Introduction to the Legal Process.

Students will ideally have completed some or all of the remaining lower-division requirements before declaring the major.

Transfer students should also consult the Transfer Information and Policy section.

Appeal Process

Students who are approaching the campus declaration deadline and who have not completed LGST 10, with a grade of C or better may petition to declare the major. This petition will either be approved, denied, or provided with conditions (e.g., completion of other courses with certain grades) to be resolved within at most one more enrolled quarter.

How to Declare a Major

Students who are eligible to declare the major must complete the legal studies academic planning form and share it via email with ymonterh@ucsc.edu. Declaration of major workshops provide additional information on this process and are offered each quarter.

Students develop a program of study during the major declaration process. The major requirements consist of 11 courses, mapped out in the Requirements and Planners tab. Please also see the bottom of the Requirements and Planners tab for a four-year sample course plan for legal studies majors.

Transfer Information and Policy

Transfer Admission Screening Policy

No major preparation courses are required prior to transfer; however, one of the following courses or their equivalents are recommended to ensure timely graduation.

PHIL 9	Introduction to Logic	5
PHIL 22	Introduction to Ethical Theory	5
PHIL 24	Introduction to Ethics: Contemporary Moral Issues	5

Getting Started at UCSC as a Transfer Student

To ensure a smooth transition into UCSC and timely completion of the major, transfer students should meet with the undergraduate advisor as early as possible to discuss a two-year major planner and course enrollment. Completion of LGST 10 in the first quarter will allow timely declaration of the major (required in the second quarter of enrollment).

Letter Grade Policy

This program does not have a letter grade policy.

Course Substitution Policy

Students may petition the department to substitute only one upper-division independent study or field study toward the elective requirement in the legal studies major. UCDC and UCSAC internships are exempt from this limit.

Honors

To be considered for honors or highest honors at graduation, a student must have taken a minimum of nine (9) graded courses in the major. P/NP grades are not included when calculating GPA in the major. "Honors" and "Highest Honors" classifications will be awarded to graduating students who achieve GPAs of 3.67 and 3.8 respectively, based on classes taken within the legal studies major. Per UCSC policy, generally no more than 15 percent of the graduating class earns honors or highest honors in the major.

Requirements and Planners

Course Requirements

In addition to completing LGST 10, legal studies majors are required to take a course in philosophical logic or ethics, a course on constitutional law, and a course on international or comparative law. They must also take courses in each of three broadly defined thematic areas: theory, public law and institutions, and law and society. Within the theory theme, students may take courses such as legal theory, jurisprudence, ethics, logic, and social and political thought; within the law and society theme, courses topics range from gender to race to psychology to economics; within the public law and institutions theme, courses range from environmental law to human rights law to criminal justice to public policy. To fulfill the senior exit requirement, students can take a senior capstone seminar, or they may opt to write a senior thesis.

Lower-Division Courses

All students are required to complete and pass LGST 10 prior to declaring the major. This course is normally taken the first year.

LGST 10	Introduction to Legal Process	5
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Choose one of the following courses:

All legal studies majors are required to take one of these philosophy courses (transfer students are strongly encouraged to take a similar course prior to enrolling at UCSC).

PHIL 9	Introduction to Logic	5
PHIL 22	Introduction to Ethical Theory	5
PHIL 24	Introduction to Ethics: Contemporary Moral Issues	5

Upper-Division Courses

Complete one of the following courses:

POLI 111A	Constitutional Law	5
LGST 111B	Civil Liberties	5

Plus one of the following courses:

LGST 116	Comparative Law	5
POLI 160B	International Law	5

Thematic Core Course Requirement — 6 courses

Legal studies majors are required to take six thematic core courses, with a minimum of one in each of the three thematic areas:

- Theory
- Public Law and Institutions
- Law and Society

A. Theory Theme Courses

The following courses are offered by the Legal Studies Program, are cross-listed with LGST by another department, or are offered by another department.

Enrollment in LGST or the listed course code will count toward the legal studies "Theory" major requirements.

POLI 103	Feminist Interventions	5
POLI 105A	Ancient Political Thought	5
POLI 105B	Early Modern Political Thought	5
POLI 105C	Modern Political Thought	5
POLI 105D	Contemporary Political Theory: Modernity and its Discontents	5
PSYC 114	Human Development as a Cultural Process	5
PHIL 126	Philosophy of Social Sciences	5
SOCY 128C	Social History of Democracy, Anarchism, and Indigenism	5
SOCY 128J	The World Jury on Trial	5
PHIL 140	History of Ethics	5
PSYC 140M	Legitimizing (In)Equality: Attitudes, Beliefs, and Social Policy	5
PHIL 144	Topics in Social and Political Philosophy	5
LGST 146	Philosophy of Law	5

ENVS 147	Environmental Inequality/Environmental Justice	5	ENVS 152	International Environmental Politics	5
ANTH 148	Gender and Global Development	5	LGST 152	Courts and Litigation	5
PHIL 153	Philosophy of Race	5	LGST 153	Immigration, Citizenship, and Law	5
LGST 155	Topics in American Legal History: Making of American Constitutionalism	5	LGST 155	Topics in American Legal History: Making of American Constitutionalism	5
LGST 157	Political Jurisprudence	5	LGST 156	Administrative Law and Challenges of Regulation	5
LIT 168A	The Culture of Islamic Law	5	LGST 159	Property and the Law	5
ART 172	Public Art: Memory, Landscape, and Artist as Activist	5	POLI 167	Politics of International Trade	5
ART 181	Art, Power & Politics	5	LGST 173	Disability, Law, & Politics	5
ANTH 187	Cultural Heritage in Colonial Contexts	5	POLI 175	Human Rights	5
FMST 194O	The Politics of Gender and Human Rights	5	POLI 186	Global Health Politics	5
			LGST 188A	Introduction to the Legal Profession and Legal Aid Work	2
			OAKS 188B	Legal Field Practice: Professional Skills and Ethics	3

B. Public Law and Institutions Theme Courses

The following courses are offered by the Legal Studies Program, are cross-listed with LGST by another department, or are offered by another department. Enrollment in LGST or the listed course code will count toward the legal studies "Public Law and Institutions" major requirements.

POLI 111A	Constitutional Law	5			
LGST 111C	Issues in Constitutional Law	5			
LGST 115	Law and the Holocaust	5	LGST 108	Gender, Sexuality, and Law	5
LGST 116	Comparative Law	5	POLI 110	Law and Social Issues	5
SOCY 117E	Migrant Europe	5	HIS 110B	Revolutionary America, 1740-1815	5
POLI 120C	State and Capitalism in American Political Development	5	ANTH 110C	California Pasts	5
LGST 125	History of the U.S. Penal Culture	5	HIS 110D	The Civil War Era	5
ECON 128	Poverty and Public Policy	5	LGST 111B	Civil Liberties	5
SOCY 128J	The World Jury on Trial	5	LGST 113	Gay Rights and the Law	5
SOCY 128M	International Law and Global Justice	5	LGST 114	Jews, Anti-Semitism, and the American Legal System	5
LGST 131	Wildlife, Wilderness, and the Law	5	LGST 117	Sports, Law, and Politics	5
POLI 132	California Water Law and Policy	5	POLI 120B	Society and Democracy in American Political Development	5
LGST 133	Law of Democracy	5	POLI 120C	State and Capitalism in American Political Development	5
POLI 134	Congress: Representation and Legislation	5	POLI 121	Race & Justice in America	5
LGST 135	Native Peoples Law	5	SOCY 122	The Sociology of Law	5
LGST 136	Federal Indian Law and International Comparative Indigenous Peoples' Law	5	SOCY 127	Drugs in Society	5
LGST 137	International Environmental Law and Policy	5	SOCY 128	Law and Politics in Contemporary Japan and East Asian Societies	5
LGST 139	War Crimes	5	ANTH 130C	Politics and Culture in China	5
ENVS 140	National Environmental Policy	5	LGST 135	Native Peoples Law	5
ENVS 149	Environmental Law and Policy	5	ANTH 138	Political Anthropology	5
			ANTH 142	Anthropology of Law	5
			ENVS 144	Global Climate Change Politics	5

C. Law and Society Theme Courses

The following courses are offered by the Legal Studies Program, are cross-listed with LGST by another department, or are offered by another department. Enrollment in LGST or the listed course code will count toward the legal studies "Law and Society" major requirements.

PSYC 147A	Psychology and Law	5
PSYC 147B	Psychology and Law	5
LGST 150	Children and the Law	5
POLI 151	Politics of Law	5
LGST 153	Immigration, Citizenship, and Law	5
LGST 154	The Legal Profession	5
LGST 155	Topics in American Legal History: Making of American Constitutionalism	5
ECON 160A	Industrial Organization	5
LGST 161	Intellectual Property	5
ECON 162	Legal Environment of Business	5
LIT 168A	The Culture of Islamic Law	5
ECON 169	Economic Analysis of the Law	5
LGST 173	Disability, Law, & Politics	5
ECON 183	Women in the Economy	5
LGST 185	Legal Studies Internship/Field Seminar: Experiences in Law, Policy, and Society	5
ANTH 187	Cultural Heritage in Colonial Contexts	5
ANTH 187B	Cultural Resource Management	5
LIT 189A	De la conquista a Sor Juana	5
FMST 194O	The Politics of Gender and Human Rights	5

Electives

Disciplinary Communication (DC) Requirement

Students in every major must satisfy that major's upper-division disciplinary communication (DC) requirement. The DC requirement in legal studies is satisfied by completing one of the following three alternatives:

1. Both

POLI 111A	Constitutional Law	5
POLI 160B	International Law	5

2. OR a Senior Seminar

LGST 196	Senior Capstone	5
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3. OR a Senior Thesis (two or three quarters)

LGST 195A	Senior Thesis	5
LGST 195B	Senior Thesis	5
LGST 195C	Senior Thesis	5

Comprehensive Requirement

Students can satisfy the senior comprehensive requirement in the legal studies major by successfully completing one of the following two options:

Senior Capstone

The capstone is designed to provide an interdisciplinary integration of themes related to the study of law and includes a substantial writing requirement.

LGST 196	Senior Capstone	5
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Senior Thesis (2-3 quarters).

Completion of a senior thesis of a minimum of 50 pages with a substantial research content, supervised by a legal studies faculty member or affiliate.

LGST 195A	Senior Thesis	5
LGST 195B	Senior Thesis	5
LGST 195C	Senior Thesis	5

Planners

Sample four-year and two-year course plans for students majoring in legal studies are provided below.

Four-Year Sample Course Planner for Frosh Students

Year	Fall	Winter	Spring
1st (frosh)		LGST 10	Phil 9 or 22
2nd (soph)	LGST (Law & Society Core)	LGST (Theory Core)	LGST (Law & Society Core) POLI 160B/LGS T 160B (Required)
3rd (junior)	LGST (Theory Core)	POLI 111A/LGS T 111A (Required)	
	LGST (Public Law & Institutions Core)	LGST (Public Law & Institutions Core)	
4th (senior)	LGST 196 (Capstone)		

In addition to the specific courses shown in this four-year planner, a student must complete courses satisfying the general education requirements. See the UCSC Legal

Studies website to view courses and designations for which courses fulfill the majors' three-core thematic requirements: Theory, Public Law and Institutions, and Law & Society.

Two-Year Sample Course Planner for Transfer Students

Year	Fall	Winter	Spring
1st (junior)	LGST 10	LGST (Law & Society Core)	POLI 160B/LGS T-160B (required)
	PHIL 9*	LGST (Theory Core)	LGST (Public Law & Institutions) LGST (Law & Society Core)
2nd (senior)	LGST (Public Law & Institutions)	LGST 196 (Senior Capstone)	
	LGST (Theory Core)	POLI 111A/LGS T 111A (Required)	

This planner assumes that a student has completed all general education requirements, beyond major preparation requirements before coming to UCSC. See the UCSC Legal Studies website to view courses and designations for which courses fulfill the majors' three-core thematic requirements: Theory, Public Law and Institutions, and Law & Society.

*Articulated equivalent courses may be taken prior to transfer.

LEGAL STUDIES MINOR

Course Requirements

The legal studies minor comprises six courses: LGST 10 plus any five upper-division LGST courses.

Students in the legal studies minor are not required to follow major requirements such as taking courses in each thematic area, the philosophy (ethics) requirement, or a senior seminar course.

Lower-Division Courses

One lower-division course.

LGST 10	Introduction to Legal Process	5
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Upper-Division Courses

Any five upper-division electives may be used to complete the minor.

The following courses are offered by the Legal Studies (LGST) Program, are crosslisted with LGST by another department, or are offered by another department. Enrollment in LGST or the course code listed will count toward the legal studies major requirements.

POLI 102	Doing Research	5
POLI 103	Feminist Interventions	5
LGST 108	Gender, Sexuality, and Law	5
LGST 109	Legal Theory	5
HIS 110B	Revolutionary America, 1740-1815	5
HIS 110D	The Civil War Era	5
ANTH 110C	California Pasts	5
LGST 111B	Civil Liberties	5
LGST 111C	Issues in Constitutional Law	5
LGST 113	Gay Rights and the Law	5
LGST 114	Jews, Anti-Semitism, and the American Legal System	5
PSYC 114	Human Development as a Cultural Process	5
LGST 115	Law and the Holocaust	5
LGST 116	Comparative Law	5
LGST 117	Sports, Law, and Politics	5
LGST 118	Law and Literature	5
HIS 121B	African American History: 1877 to the Present	5
LGST 125	History of the U.S. Penal Culture	5
LGST 130	Inequality and Law	5
ANTH 130C	Politics and Culture in China	5
LGST 131	Wildlife, Wilderness, and the Law	5
LGST 133	Law of Democracy	5
LGST 135	Native Peoples Law	5
LGST 136	Federal Indian Law and International Comparative Indigenous Peoples' Law	5
LGST 137	International Environmental Law and Policy	5
LGST 139	War Crimes	5
ENVS 140	National Environmental Policy	5
PHIL 140	History of Ethics	5
PSYC 140M	Legitimizing (In)Equality: Attitudes, Beliefs, and Social Policy	5
LGST 146	Philosophy of Law	5
ANTH 148	Gender and Global Development	5
LGST 150	Children and the Law	5
ENVS 152	International Environmental Politics	5
LGST 152	Courts and Litigation	5

LGST 153	Immigration, Citizenship, and Law	5
PHIL 153	Philosophy of Race	5
PSYC 153	The Psychology of Poverty and Social Class	5
LGST 154	The Legal Profession	5
LGST 155	Topics in American Legal History: Making of American Constitutionalism	5
LGST 156	Administrative Law and Challenges of Regulation	5
LGST 157	Political Jurisprudence	5
LGST 158	Law and Politics of Memory	5
LGST 159	Property and the Law	5
POLI 160B	International Law	5
LGST 161	Intellectual Property	5
LIT 168A	The Culture of Islamic Law	5
LGST 173	Disability, Law, & Politics	5
POLI 175	Human Rights	5
ENVS 179	Environmental Interpretation	5
LGST 185	Legal Studies Internship/Field Seminar: Experiences in Law, Policy, and Society	5
SOCY 185	Environmental Inequality	5
POLI 186	Global Health Politics	5
ANTH 187	Cultural Heritage in Colonial Contexts	5
ANTH 187B	Cultural Resource Management	5
LGST 188A	Introduction to the Legal Profession and Legal Aid Work	2
OAKS 188B	Legal Field Practice: Professional Skills and Ethics	3
FMST 194O	The Politics of Gender and Human Rights	5
LALS 194X	Extractivism and Socio-Environmental Conflicts in the Americas	5

POLITICS PH.D.

Introduction

The Faculty

The work of the UCSC Politics Department's faculty has led the field toward interdisciplinary and engaged research, and represents the diverse cutting edge of U.S. and international political research. A group of affiliated graduate faculty extends the program's intellectual breadth and the range of the course offerings.

The department enjoys several areas of special strength, including American political development, the social foundations of democratic politics and democratization; political economy; politics of the developing world; the politics of language; sub-national politics; post-colonial

theory and nationalist discourse; early modern political thought; and informal and translocal political organization.

The Curriculum

The Politics Department is impressed by the fact that many of the best studies of politics today disregard the conventional boundaries of the political science's disciplinary subfields. Therefore, the core graduate curriculum and qualifying examination process are structured around four interrelated themes central to political inquiry. Each of these areas of emphasis focuses, in a different way, on the relations among material life, institutional authority, collective mobilization, and political vision at all levels of politics.

Political and Social Thought. Brings together the history of political thought; contemporary social and critical theory; and the contributions of legal and institutional analysis of various kinds. This area of inquiry emphasizes the critical study of political practices that are experienced or understood as in some way limiting, oppressive, or wrong. The work of political and social theory as we see it is to transform our understanding of these practices; to see their contingent conditions; and to articulate the possibilities of governing ourselves differently.

Political and Social Forces. Concerns the interaction of social forces and political forces, drawing upon the work of scholars focused on social mobilizations and histories. Accordingly, this area of inquiry focuses on the articulation and organization of political interest and identities. This area studies the mutual interaction of these interests and identities with structure (states, discourses, public policy, and the law) uniting substantive and theoretical concerns across regional, national, and global politics.

States and Political Institutions. Emphasizes the international study of political institutions as instruments of collective decision-making and action. This area of inquiry focuses on the state and on transnational, subnational, and regional political institutions. In this area, we emphasize historical patterns of institutional development in relation to domestic political conflict and the changing contours of international political economy and patterns of conflict and cooperation among states.

Political Economy. Focuses on the relationship between states, markets, and societies. This area of inquiry explores the various understandings of political economy that have emerged within a number of different theoretical perspectives, including Marxism, realism, and liberalism. At subnational, national, and supranational levels, this area seeks to understand political economy outcomes as the result of the mutual interactions between political institutions, societal interests, and ideas and norms.

The politics graduate curriculum works critically upon and within conventional social science research and also ranges beyond its methods, drawing upon cultural studies,

historical sociology, and history as they inform the study of politics. Students in the politics graduate program also work with faculty in other distinguished departments at UCSC, including literature, history of consciousness, history, Latin American and Latino studies, environmental studies, sociology, philosophy, international economics, and feminist studies.

Scholars and students in the program emphasize the articulation of important questions prior to the development of methods for grappling with them, while recognizing the importance of appropriate methodological tools for doing meaningful political research.

To support the growth of students as scholars, the department also offers a series of professional development sessions to introduce and help develop the skills of successful academic work. All graduate students are also expected to attend department events with notable visitors brought to campus for public lectures, presentation, and/or graduate colloquia.

Advancement to Candidacy

Course Requirements

All curricular requirements are aimed at preparing students for timely and successful completion of a doctoral dissertation. The graduate curriculum in politics includes seven stages: 1) three core seminars plus POLI 201, Logics of Inquiry seminar; 2) five other graduate-level Politics Department courses; 3) three additional graduate-level courses that may be from Politics or other departments, along with further training as appropriate in language and methodology; 4) teaching assistant seminar training; 5) a qualifying examination consisting of written and oral parts; 6) the research and writing of the dissertation; and 7) its oral defense.

Core Seminars and Methods Training

Required Core Seminars:

During the first two years in residence, students are required to take three of the four core seminars that correspond to the areas of emphasis:

POLI 200A	Political and Social Thought Core Seminar	5
POLI 200B	Social Forces and Political Change Core Seminar	5
POLI 200C	States and Political Institutions Core Seminar	5
POLI 200D	Political Economy Core Seminar	5

Logics of Inquiry:

The department also recognizes the importance of informed and critically engaged methodology. Logics of Inquiry, POLI 201, is a required course that investigates approaches to the study of politics and to the enterprise of social science in general. We also regularly offer POLI 202, Political Research, a seminar providing a foundation

in qualitative methods, and occasionally offer other methods courses as well. Students sometimes pursue further coursework in other UC Santa Cruz departments, and the department has sent many students to summer training programs such as the Institute for Qualitative and Multi-Method Research (IQMR).

POLI 201	Logics of Inquiry	5
POLI 202	Fundamentals of Political Research	5

Additional Courses

Prior to the qualifying examination, a minimum of five additional politics graduate courses taught by Politics Department faculty or affiliated graduate faculty must be completed. Three additional graduate-level courses are also required, which may be taken from any UCSC department (including Politics).

Each candidate shall develop with his or her advisor language and method requirements appropriate to the student's project, graduate education, and career goals.

Foreign Language Requirements

Teaching Requirement

Throughout its history, the department has been strongly committed to undergraduate teaching. The graduate program offers graduate students the opportunity to work closely with faculty and undergraduates as teaching assistants. The Politics Department's faculty is committed to "the teaching of teaching": its training of college educators emphasizes the importance of civic education in undergraduate instruction. All students who are teaching assistants will be required to attend a TA training program in which pedagogic and substantive issues will be considered.

See our website for details about the policies for admission to graduate standing as well as the application, and information about financial-support opportunities. For more information, refer to the Graduate Division website.

Qualifying Examination

The Qualifying Examination (QE) process intends to demonstrate a student's mastery of and engagement with a range of literatures, including a) core literatures in two of the program's four areas of emphasis, and b) specialized literatures relevant to the research trajectory. It provides a forum to specify and develop research questions and plans for the dissertation.

Preparation begins with the first core seminar and continues throughout the required coursework. The QE is completed during the third year and has three components: 1) two written examinations; 2) the dissertation prospectus; and 3) an oral examination. All components are evaluated by a committee of four faculty members, one of whom is not a member of the Politics Department.

Students must complete the QE process by the end of their third year. A student who fails any component of the QE process twice will not be permitted to continue in the program.

Dissertation

Dissertation

Upon advancing to candidacy students begin formal work on the dissertation, with the assistance and oversight of the dissertation committee.

Dissertation Committee

The dissertation committee must be composed of at least three professors, two of whom (including the chair) are members of the Politics faculty. The dissertation committee is selected by the student and approved by the Graduate Division. The dissertation committee need not be the same as the QE committee. The chair of the two committees can be the same professor.

Dissertation Defense

Upon completion, the student will be asked to defend her/his dissertation before the dissertation committee.

Academic Progress

Normative time to completion of the Ph.D. is six years. Upon advancement to candidacy, students are expected to complete the dissertation within three years.

At the end of each academic year, whether the student is in residence at UC Santa Cruz or not, s/he will file a statement of progress with the dissertation committee.

If the Ph.D degree is not awarded within seven years from the date of advancement to candidacy, the student's candidacy shall lapse and the student will be required to pass a new qualifying exam prior to submitting the dissertation or undergo such other formal review as the department directs.

Applying for Graduation

At the end of the dissertation writing process, the student must file a petition for the degree, format the dissertation according to Graduate Division guidelines, complete an oral defense, and obtain signatures of the committee members on the official title page. Once these items are complete, the student may file the dissertation to complete the Ph.D.

Students must either be registered or on Filing Fee the quarter in which the degree is to be conferred. In order to be eligible for Filing Fee, a student must have been registered or on an approved leave of absence the previous quarter.

[Optional Catchall]

POLITICS DESIGNATED

EMPHASIS

Introduction

Graduate students in politics may obtain a designated emphasis on the politics Ph.D. diploma indicating they have completed an additional specialized course of study in another department that offers a designated emphasis. Please consult the department of interest for more information.

Requirements

To receive a designated emphasis in politics, graduate students from other departments must complete the following requirements **in addition to degree requirements for the doctorate in their home (or coordinating) department.**

Committee Composition and Departmental Approvals

The student must have a designated faculty advisor from among the politics core faculty. This advisor will be in addition to the faculty advisor from the student's home department. The politics advisor must serve on the student's qualifying examination committee and on the student's dissertation committee.

Course Requirements

The student must take four (4) graduate courses offered by the Politics Department. Two of these courses must be core courses (Political and Social Thought, Political Institutions, Political Economy, or Social Forces) and two courses may be electives appropriate to the student's thesis research. No more than one of these two elective courses may be an independent study.

POLI 200A	Political and Social Thought Core Seminar	5
POLI 200B	Social Forces and Political Change Core Seminar	5
POLI 200C	States and Political Institutions Core Seminar	5
POLI 200D	Political Economy Core Seminar	5

Writing, Research and/or Teaching Requirements

The student must prepare a significant piece of writing in the area of politics. This writing may take the form of a doctoral dissertation chapter or a paper to be submitted for publication.

Academic Progress

[Optional Catchall]

Psychology

273 Social Sciences 2 Building
(831) 459-2002
<https://psychology.ucsc.edu/>

PROGRAMS OFFERED

Psychology B.A. (p. 694)

Cognitive Sciences B.S. (p. 702)

Psychology Ph.D. (p. 707)

UNDERGRADUATE PROGRAMS

The Psychology Department offers undergraduate programs in psychology (B.A.) and cognitive science (B.S.)

Psychology B.A.

Psychology majors at UC Santa Cruz are introduced to theory and scientific research in the field. Students begin with lower-division courses that include introductory psychology, precalculus, statistics, and introduction to developmental psychology. In addition, majors take upper-division courses in research methods and several areas of psychology.

The department offers coursework in cognitive, social, developmental, and clinical-personality psychology. Cognitive psychology focuses on topics such as perception; brain and behavior; motor control; learning and memory; thinking, feeling, and emotions; psycholinguistics; computational modeling, and human-computer interaction. Our cognitive psychologists extend traditional boundaries in the study of cognition to encompass bodies, physical environments, sociocultural contexts, and information technologies. Social psychology involves the study of persons embedded within social contexts. Social psychology courses at UC Santa Cruz are organized around themes of social justice. Developmental psychology is concerned with processes of cognitive, language, social, emotional, and personality development across the life span. Additionally, both developmental and social psychology are concerned with issues of diversity including race, ethnicity, culture, gender, sexual identity, social class, and family structure. Clinical-personality psychology focuses on issues of individual traits, psychological distress, well-being, and adjustment.

The Psychology Department offers a general psychology major and an intensive major. The intensive psychology major requires additional coursework in research methods as well as additional research or field study credits. See program descriptions below for details.

The B.A. programs in psychology provide a foundation for a career in psychological research, clinical practice, industry, or non-profits. Some careers in psychology require master's or doctoral degrees, for instance focused on research or clinical practice. Students primarily interested in clinical and counseling psychology should realize that training in these areas does not occur at the undergraduate level but requires professional training

through an advanced degree. UC Santa Cruz does not offer advanced degrees in clinical or counseling psychology.

Cognitive Science B.S.

Cognitive science focuses on achieving a scientific understanding of how human cognition works. Its subject matter encompasses cognitive functions (such as memory and perception), the structure and use of human language, the evolution of the mind, artificial intelligence, and more.

The cognitive science degree provides a strong grounding in the principles of cognition through courses in cognitive psychology, and, in addition, provides breadth in the interdisciplinary aspects of cognitive science such as anthropology, linguistics, biology, philosophy, and computer science. Graduates will be well prepared for advanced training in research fields of cognitive psychology and cognitive neuroscience, technology industries such as human-computer interaction, and health fields, such as the treatment of brain disorders.

The cognitive science major is intended for students wishing to enter graduate programs in cognitive psychology, cognitive science, or cognitive neuroscience to pursue careers in research; enter the field of public health to work with individuals with neurological disorders or learning disabilities; to enter the field of human-computer interaction design; or pursue other related careers.

GRADUATE PROGRAM

The psychology program offers three areas of specialization leading to the doctoral degree: cognitive, developmental, and social psychology. The program prepares students for research, teaching, and administrative positions in colleges and universities as well as for positions in schools, government, and other public and private institutions. Each student is primarily associated with one of the three research areas and participates in the courses and research forums sponsored by the faculty in that area. The program requires full-time enrollment as a graduate student. Although applicants for a master's degree are not accepted, students in the doctor of philosophy (Ph.D.) program may obtain a master of science (M.S.) degree by fulfilling specific requirements. Note that the program does not offer courses, training, or supervision in clinical psychology.

The cognitive psychology graduate program focuses on research of "Minds, Brains, and Beyond," offering a blend of traditional topics and new directions in cognitive science. With core strengths in language and interaction, memory and learning, and perception and performance, we are exploring topics such as: reading, speaking, psycholinguistics, discourse processing; language production and comprehension; bilingualism and multilingualism; remembering and forgetting; metacognition in learning and memory; creative cognition; cognitive offloading and transactive memory;

socially distributed remembering and collective memory; human performance, information processing, and computational cognitive modeling; working memory and executive control; visual psychophysics; face perception; sensory integration; perception in virtual reality; cognitive and computational neuroscience; perceptual decision-making, attention, and awareness. Our graduates find careers in academia, tech industries, and more.

The developmental psychology graduate program focuses on research that integrates cultural, interpersonal, and individual aspects of human development. We focus especially on issues of diversity in relation to culture, ethnicity, race, gender, sexuality, and social economic opportunity as people engage across contexts of family, peers, school, community, technology, and media. Our programs of research include moral and emotional development; neurodiversity; language and cognitive development; learning through observation and social interaction; children and playable media; personal and social identities; family and peer relationships; communication technologies; prejudice and discrimination; gender development; adolescent development; the transition to adulthood; school climate and motivation; and diversity issues in university outreach programs. Several of our faculty carry out research in cultural communities outside the U.S. and collaborate with faculty in the U.S. and other nations. At UC Santa Cruz, our interdisciplinary collaborations with other programs (such as computer engineering, computational media, education, Latin American and Latino studies, linguistics, and philosophy) help nurture students' research and prepare them for a wide variety of careers. Graduates of our program have accepted positions in academia, research institutes, and community and non-profit organizations.

The social psychology graduate program at UC Santa Cruz has a unique mission and focus. We use Kurt Lewin's model of "full-cycle" social psychology (theory-application-action) to study a broad range of topics related to social justice. In this way, knowledge gained in action-oriented research leads, in turn, to the development of new theory. Accordingly, our students learn to apply psychological theories and data to the analysis and solution of a wide range of social problems. We use a variety of research methods to examine justice-related issues in different cultural, political, and policy contexts. Our students are trained in laboratory, field, and survey methods; they are encouraged to attend to issues of race, class, sexuality, ethnicity, gender, and physical ableness; and, in addition to traditional social psychological approaches, are steeped in critical theoretical perspectives such as feminist theory. Our graduates go on to successful careers in academia as well as in community, government, and non-profit settings. Our approach to research and training, combined with the quality and competencies of our faculty, make our program among the nation's best for the psychological study of social justice issues. Current faculty research interests include: aggression and trauma; educational quality/access; achievement and disparities; feminisms; institutional analysis; intersectionality; narrative and identity; race as a

social process; social identities and stigmatization of immigrant-origin students; poverty and economic justice; power and oppression; psychology and law; sexual and gender diversity; sexuality; social identity; social policy analysis; and structural inequality.

Graduate students in psychology may obtain a designated emphasis on the psychology Ph.D. diploma indicating that they have obtained additional training in another discipline such as feminist studies, Latin American and Latino studies, or sociology. For the full list of programs that offer a designated emphasis, see the Fields of Study section of the catalog. For specific requirements for a designated emphasis in a program, please refer to the program statement for that department.

Details on the policies for admission to graduate standing and requirements for the Ph.D. degree, as well as the online application can be found on the Division of Graduate Studies website. The department's graduate program brochure, and faculty research are available on the department website.

PSYCHOLOGY B.A.

Information and Policies

Introduction

Academic Advising for the Program

The Psychology Department has an advising office located at 273 Social Sciences 2, (831) 459-2002, psyadv@ucsc.edu. The advisors assist students in obtaining information regarding major requirements and petitions, course planning, substitution of transfer courses for advance enrollment, careers, and graduate schools. Students are encouraged to take advantage of the advising office throughout their college career. Transfer students are encouraged to consult the Transfer Information and Policy Section.

Getting Started in the Major

Students interested in pursuing the psychology major should complete PSYC 1, the mathematics requirement, and the statistics requirement (see below for courses that can be used to satisfy these requirements). PSYC 1 and the statistics requirement must be taken for a letter grade. If the minimum grade (B-) is not met for PSYC 1, PSYC 10 must be taken for a letter grade. After completing these three lower-division requirements, students may petition to declare the psychology major subject to the grade requirements described in the Qualification to the Major section below.

High school students considering psychology as their university major find that the best preparation is a solid general education in English writing and mathematics (including precalculus), and social sciences.

Program Learning Outcomes

Students who complete the psychology major should demonstrate competency in:

- **Application of knowledge with critical thinking skills.** Students should be able to use critical thinking to evaluate and interpret evidence, and to apply psychological concepts, theories, and research findings to individual, social, and cultural issues.
- **Application of research methods with values and integrity.** Students should be able to apply basic research methods in psychology, with sensitivity to ethical principles.
- **Communication skills.** Students should be able to demonstrate effective communication skills following professional conventions in psychology appropriate to purpose and context.
- **Awareness of sociocultural diversity and societal inequality.** Students should be able to understand the complexity of sociocultural diversity and societal inequality in the inquiry and analysis of psychological issues.

Major Qualification Policy and Declaration Process

Major Qualification

Students may petition to declare the psychology major once they have demonstrated foundational skills by completing each of the following three requirements:

One of the following courses

Mathematics requirement

AM 3	Precalculus for the Social Sciences	5
AM 6	Precalculus for Statistics	5
AM 11A	Mathematical Methods for Economists I	5
MATH 3	Precalculus	5
MATH 4	Mathematics of Choice and Argument	5
MATH 11A	Calculus with Applications	5
MATH 11B	Calculus with Applications	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5

Or take the placement exam

Score 300 or higher on the ALEKS Mathematics Placement or score a 3, 4, or 5 on either the AP Calculus AB or the AP Calculus BC examination.

Plus take the following course and obtain a B- or

better

PSYC 1	Introduction to Psychology	5
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PSYC 1 must be taken in order to declare. If a B- or better grade is not achieved in PSYC 1, achieving a B- or better in PSYC 10 or PSYC 20 will fulfill declaration requirements.

Plus one of the following options and obtain a grade of B- or better

Either this course		
PSYC 2	Introduction to Psychological Statistics	5
or this course		
STAT 5	Statistics	5
or these courses		
STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

Or a score of 4 or 5 on the AP Statistics exam.

Appeal Process

Students who did not satisfy the major admission requirements but believe that there are extenuating circumstances concerning their performance in the foundational courses may file a written appeal describing these circumstances; however, such appeals are rarely granted. Appeals may be filed by emailing psyadv@ucsc.edu. The department will notify the student and college of the decision within 15 days of the receipt of the appeal.

How to Declare a Major

Students should submit a petition to declare as soon as they complete the major qualification courses or reach their declaration deadline quarter, whichever comes first.

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed major qualification courses.

To petition to declare the major, students should follow the instructions on the department's psychology major website.

Transfer Information and Policy

Transfer Admission Screening Policy

The following courses or their equivalents are required prior to transfer, by the end of the spring term for students planning to enter in the fall:

- Minimum grade of B- (2.7)* in a course articulated to UC Santa Cruz's PSYC 1, Introduction to Psychology (An AP Psychology score of 4 or 5 can substitute for PSYC 1.) *Note: If a grade of C (2.0) or C+ (2.3) was earned in an equivalent course, a student must earn a minimum grade of B- (2.7) in a course articulated to UC Santa Cruz's PSYC 10, Introduction to Developmental Psychology, or PSYC 20, Cognition: Fundamental Theories.
- Minimum grade of B- (2.7) in a course articulated to UC Santa Cruz's PSYC 2, Introduction to Psychological Statistics, or STAT 5 or STAT 7 & STAT 7L, Statistics. (An AP Statistics score of 4 or 5 can substitute for PSYC 2 or STAT 5.)
- Minimum grade of C (2.0) in a course articulated to UC Santa Cruz's MATH 3, Precalculus. (An AP Calculus AB or BC score of 3, 4, or 5 can substitute for MATH 3.) Please note that an acceptable course in calculus may be used as a substitution of this course requirement. Business calculus is also acceptable.

In addition, the following courses are recommended prior to transfer to ensure timely graduation:

- PSYC 10, Introduction to Developmental Psychology
- PSYC 20, Cognition: Fundamental Theories

Prospective students are also encouraged to complete the Intersegmental General Education Transfer Curriculum (IGETC) or to complete all UC Santa Cruz general education requirements before matriculation.

Getting Started at UCSC as a Transfer Student

Transfer students who satisfy the requirements of the screening policy can declare the major at any time after matriculation at UC Santa Cruz. See the How to Declare the Major Section.

Letter Grade Policy

PSYC 1 and the statistics requirement must be taken for a letter grade. If alternative courses are taken to meet the major qualification requirements, they must also be taken for a letter grade (e.g., PSYC 10 or PSYC 20).

[Optional Catchall]

Course Substitution Policy

Students who want to fulfill requirements with courses taken at other colleges (excluding articulated courses from California community colleges) must petition for

the substitution of their transfer courses via email to psyadv@ucsc.edu. PSYC 100, Research Methods in Psychology, and the senior seminar must be taken at UC Santa Cruz. Students planning to transfer to UC Santa Cruz should check with the advising office of their present college or refer to assist.org.

Double Majors and Major/Minor Combinations Policy

Upper-division courses from other departments taken to fulfill the psychology elective requirement may not be counted toward another major or minor (See "Course Requirements" in "Upper-Division Courses" below). Students wishing to pursue double majors or a major/minor combination are encouraged to meet with a peer advisor to create an academic plan to do so.

Study Abroad

Up to three courses taken through UC Santa Cruz study abroad may be approved for the major, and prior course approval is recommended. Please review the department's study abroad webpage if you are considering studying abroad and want to try to obtain approval for such courses to count toward the major.

Honors

Honors in the psychology major are awarded to graduating seniors whose UC Santa Cruz grade point average is a 3.6 or higher in psychology courses (1-189).

Highest honors in the major are reserved for students who meet the honors criteria as well as successful completion of a senior thesis, or whose UC Santa Cruz grade point average is a 3.9 or higher in psychology courses (1-189).

Research, Field Study, and Other Educational Opportunities

The Psychology Department offers a range of educational opportunities, including opportunities for field study and undergraduate research. For more information, see educational opportunities.

General Psychology Major

Course Requirements

Thirteen courses are required for the general major. Here is a brief overview of these courses:

- Five lower-division courses are required before completing most upper-division courses. These should be completed as soon as possible, ideally by the end of the sophomore year. They include:
 - three lower-division courses required for declaration (PSYC 1, mathematics requirement, and statistics requirement), and
 - two additional lower-division courses (PSYC 10, PSYC 20)

- PSYC 100, Research Methods, which is a prerequisite for many other upper-division courses and fulfills half of the Disciplinary Communication requirement. This course **MUST** be taken at UC Santa Cruz.
- Six additional upper-division courses in psychology, including a senior seminar (see below for details)
- One non-psychology upper-division course (see below for details)

Lower-Division Courses

Take this course:

PSYC 1 Introduction to Psychology 5

Or a score of 4 or 5 on the AP Psychology exam.

Plus one of the following options:

Either this course

PSYC 2 Introduction to Psychological Statistics 5

or this course

STAT 5 Statistics 5

or these courses

STAT 7 Statistical Methods for the Biological, Environmental, and Health Sciences 5

STAT 7L Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory 2

Or a score of 4 or 5 on the AP Statistics exam.

Plus:

PSYC 10 Introduction to Developmental Psychology 5

Plus:

PSYC 20 Cognition: Fundamental Theories 5

Plus one of the following courses:

AM 3 Precalculus for the Social Sciences 5

AM 6 Precalculus for Statistics 5

AM 11A Mathematical Methods for Economists I 5

MATH 3 Precalculus 5

MATH 4 Mathematics of Choice and Argument 5

MATH 11A Calculus with Applications 5

MATH 11B Calculus with Applications 5

MATH 19A Calculus for Science, Engineering, and Mathematics 5

MATH 19B Calculus for Science, Engineering, and Mathematics 5

Score 300 or higher on the ALEKS Mathematics Placement or score a 3, 4, or 5 on either the AP Calculus AB or the AP Calculus BC examination.

Upper-Division Courses

Eight upper-division courses are required for the general major. At least five of the eight courses (including PSYC 100), must be taken through the psychology program at UC Santa Cruz, not transferred from elsewhere (the five courses include psychology courses only, not the out-of-department course). After all substitutions have been made, students must satisfy the fundamental requirement that they take at least one upper-division UC Santa Cruz psychology course from each of the Developmental, Cognitive, and Social subfields.

Research Methods:

PSYC 100 Research Methods in Psychology 7

One course in each of the following subfields (three courses):

- Developmental (courses numbered PSYC 101-PSYC 119)
- Cognitive (courses numbered PSYC 120-PSYC 139)
- Social (courses numbered PSYC 140-PSYC 159)

One additional 5-credit upper-division course from THREE of the subfields listed below (i.e., a total of three courses, each from a separate subfield):

- Developmental (PSYC 101-PSYC 119)
- Cognitive (PSYC 120-PSYC 139)
- Social (PSYC 140-PSYC 159)
- Clinical-Personality (PSYC 160-PSYC 179)
- Methods (PSYC 180-PSYC 189)
- Independent Study (PSYC 193-PSYC 199)

One upper-division course outside of psychology:

One upper-division course from one of the following related areas outside of psychology. The course must be 5 credits, and neither crosslisted with psychology nor taught by psychology faculty. These courses also cannot be counted twice in cases of double majors or minors:

- Anthropology
- Community Studies
- Critical Race and Ethnic Studies

- Ecology and Evolutionary Biology
- Economics
- Education
- Environmental Studies
- Feminist Studies
- History of Consciousness
- Latin American and Latino Studies
- Legal Studies
- Linguistics
- Philosophy
- Politics
- Sociology
- Or a specific course from the list below:
- CPM 146
- CPM 148
- CSE 104
- CSE 140
- STAT 131
- STAT 132
- STAT 162

Upper-Division Seminar:

One of the upper-division courses must be an upper-division seminar; these courses are psychology courses identified within the General Catalog by their course descriptions containing the phrase “satisfies seminar requirement.”

Students can access a full list of courses on the department’s website. Upper-division courses and their catalog descriptions are grouped within each of the subfields.

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement in psychology is satisfied by completing PSYC 100 and a seminar. Seminar courses are psychology courses identified within the General Catalog by their course descriptions containing the phrase “satisfies seminar requirement,” and are numbered PSYC 119, PSYC 139, PSYC 159, and PSYC 179.

Comprehensive Requirement

UC Santa Cruz requires that every student satisfy a senior exit/comprehensive requirement prior to graduation.

Psychology students will satisfy this requirement by receiving a passing grade in a psychology seminar which is also part of the DC requirement (see above). To ensure that all students can meet the seminar requirement, students will enroll in only one senior seminar.

Planners

Following are two recommended academic plans for frosh, and one additional plan for transfer students. Plan One is a suggested guideline for frosh who are committed to the major early in their academic career. Plan Two is for frosh who are considering the major or who need more preparation. Students should note that precalculus (AM 3, or see Lower Division Courses section for other qualifying courses or test scores) is a requirement for the major and is a prerequisite for PSYC 2 and PSYC 100. The third planner is a suggested two-year guideline for transfer students.

Frosh Plan One

	Fall	Winter	Spring
1st (frosh)	PSYC 1	AM 3	PSYC 2
2nd (soph)	PSYC 20	PSYC 10	
3rd (junior)	PSYC 100	upper-division developmental	upper-division social
4th (senior)	upper-division cognitive	upper-division PSYC elective (seminar)	upper-division PSYC elective
	upper-division PSYC elective	out of dept. course	

The courses listed above will satisfy the PE, SR, and DC general education requirements. All other GE requirements have to be satisfied.

Frosh Plan Two

	Fall	Winter	Spring
1st (frosh)	MATH 2	AM 3	PSYC 1

2nd (soph)	PSYC 20	PSYC 2	PSYC 10
3rd (junior)	PSYC 100	upper-division cognitive	upper-division developmental
4th (senior)	upper-division social upper-division PSYC elective (seminar)	out of dept. course upper-division PSYC elective	upper-division PSYC elective

The courses listed above will satisfy the PE, SR, and DC general education requirements. All other GE requirements have to be satisfied.

Transfer Plan

	Fall	Winter	Spring
3rd (junior)	PSYC 100 PSYC 10	PSYC 20 upper-division social	upper-division developmental
4th (senior)	upper-division cognitive upper-division PSYC elective	out of dept. course upper-division PSYC elective	upper-division PSYC elective (seminar)

Intensive Psychology Major

Course Requirements

The intensive major involves additional upper-division coursework, including a requirement of an advanced methods class and independent study. Students intending to take the intensive major should declare this on their proposed study plan during the junior year, outlining their plan for completing the requirements. **Note:** the intensive

major designation appears on the transcript but it does not formally appear on students' diplomas.

Sixteen courses are required for the intensive major. Here is a brief overview of these courses:

- Five lower-division courses are required before completing most upper-division courses. These should be completed as soon as possible, ideally by the end of the sophomore year. They include:
 - three lower-division courses required for declaration (PSYC 1, mathematics requirement, and statistics requirement), and
 - two additional lower-division courses (PSYC 10, PSYC 20)
- PSYC 100, Research Methods, which is a prerequisite for many other upper-division courses and fulfills half of the Disciplinary Communication requirement. This course **MUST** be taken at UC Santa Cruz.
- Seven additional upper-division courses in psychology, including an advanced research course and a senior seminar (see below for details)
- Two quarters of independent study (research, field study, or senior thesis- see below for details)
- One non-psychology upper-division course (see below for details)

Lower-Division Courses

Take this course:

PSYC 1	Introduction to Psychology	5
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Or a score of 4 or 5 on the AP Psychology exam.

Plus one of the following options:

Either this course		
PSYC 2	Introduction to Psychological Statistics	5
or this course		
STAT 5	Statistics	5
or these courses		
STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

Or a score of 4 or 5 on the AP Statistics exam.

Plus:

PSYC 10	Introduction to Developmental Psychology	5
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Plus:

PSYC 20	Cognition: Fundamental Theories	5
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Plus one of the following courses:

AM 3	Precalculus for the Social Sciences	5
AM 6	Precalculus for Statistics	5
AM 11A	Mathematical Methods for Economists I	5
MATH 3	Precalculus	5
MATH 4	Mathematics of Choice and Argument	5
MATH 11A	Calculus with Applications	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 19B	Calculus for Science, Engineering, and Mathematics	5
MATH 11B	Calculus with Applications	5

Score 300 or higher on the ALEKS Mathematics Placement or score a 3, 4, or 5 on either the AP Calculus AB or the AP Calculus BC examination.

Upper-Division Courses

Eleven upper-division courses are required for the intensive major:

Research Methods:

PSYC 100	Research Methods in Psychology	7
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One course in each of the following subfields (three courses):

- Developmental (courses numbered PSYC 101-PSYC 119)
- Cognitive (courses numbered PSYC 120-PSYC 139)
- Social (courses numbered PSYC 140-PSYC 159)

One additional 5-credit upper-division course from THREE of the subfields listed below (i.e., a total of three courses, each from a separate subfield):

- Developmental (PSYC 101-PSYC 119)
- Cognitive (PSYC 120-PSYC 139)
- Social (PSYC 140-PSYC 159)
- Clinical-Personality (PSYC 160-PSYC 179)
- Methods (PSYC 180-PSYC 189)
- Independent Study (PSYC 193-PSYC 199)

One of the following:

PSYC 181	Psychological Data Analysis	5
PSYC 182	Qualitative Research Methods	5

Two quarters of study from one of the following:

PSYC 193	Field Study	5
PSYC 193A	Developmental Field Study	5
PSYC 193B	Cognitive Field Study	5
PSYC 193C	Social Field Study	5
PSYC 193D	Clinical/Personality Field Study	5
PSYC 194A	Research Internship in Developmental Psychology	5
PSYC 194B	Research Internship in Cognitive Psychology	5
PSYC 194C	Research Internship in Social Psychology	5
PSYC 195A	Senior Thesis	5
PSYC 195B	Senior Thesis	5

One five-credit course outside of psychology:

One upper-division course from one of the following related areas outside of psychology. The course must be 5 credits, and neither crosslisted with psychology nor taught by psychology faculty. These courses also cannot be counted twice in cases of double majors or minors:

- Anthropology
- Community Studies
- Critical Race and Ethnic Studies
- Ecology and Evolutionary Biology
- Economics
- Education
- Environmental Studies
- Feminist Studies
- History of Consciousness
- Latin American and Latino Studies
- Legal Studies
- Linguistics
- Philosophy
- Politics
- Sociology
- Or a specific course from the list below:

• CMPM 146	(frosh)			
• CMPM 148				
• CSE 104	2nd (soph)	PSYC 20	PSYC 10	PSYC 100
• CSE 140				
• STAT 131				
• STAT 132				
• STAT 162	3rd (junior)	Upper-division cognitive	Upper-division developmenta l	Upper-division social

Upper-Division Seminar:

One of the upper-division courses must be an upper-division seminar; these courses are psychology courses identified within the General Catalog by their course descriptions containing the phrase “satisfies seminar requirement.”

Students can access a full list of courses on the department’s website. Upper-division courses and their catalog descriptions are grouped within each of the subfields.

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement in psychology is satisfied by completing PSYC 100 and a seminar. Seminar courses are psychology courses identified within the General Catalog by their course descriptions containing the phrase “satisfies seminar requirement.” are designated in the campus catalog with the text “satisfies seminar requirement.” and are numbered PSYC 119, PSYC 139, PSYC 159, and PSYC 179.

Comprehensive Requirement

UC Santa Cruz requires that every student satisfy a senior exit/comprehensive requirement prior to graduation. Psychology students will satisfy this requirement by receiving a passing grade in a psychology seminar which is also part of the DC requirement (see above). Passing a seminar course is also required for the major. Courses that meet this requirement are designated as seminars in the campus catalog as “satisfies seminar requirement.”

Planners

Following are two recommended academic plans for frosh, and one additional plan for transfer students. Plan One is a suggested guideline for frosh who are committed to the major early in their academic career. Plan Two is for frosh who are considering the major or who need more preparation. Students should note that AM 3 is a requirement for the major and is a prerequisite for PSYC 2 and PSYC 100.

Frosh Plan One

	Fall	Winter	Spring
1st	AM 3	PSYC 1	PSYC 2

			Out of department course
4th (senior)	PSYC 193/ PSYC 194/ PSYC 195	PSYC 193/ PSYC 194/ PSYC 195	Upper-division PSYC elective
	Upper-division PSYC elective	PSYC 181/ PSYC 182	Upper-division PSYC elective (seminar)

The courses listed above will satisfy the PE, SR, and DC general education requirements. All other GE requirements have to be satisfied.

Frosh Plan Two

	Fall	Winter	Spring
1st (frosh)	MATH 2	PSYC 1	PSYC 20
4th (soph)	AM 3	PSYC 2	PSYC 10
3rd (junior)	PSYC 100	Upper-division cognitive	Upper-division developmenta l
		Out of department course	

4th (senior)	PSYC 193/ PSYC 194/ PSYC 195	PSYC 193/ PSYC 194/ PSYC 195	Upper- division PSYC elective
	Upper- divisio n PSYC elective	PSYC 181/ PSYC 182	Upper- division PSYC elective (seminar)
	Upper- divisio n social		

The courses listed above will satisfy the PE, SR, and DC general education requirements. All other GE requirements have to be satisfied.

Transfer Plan

	Fall	Winter	Spring
3rd (junior)	PSYC 100	Upper- division developmenta l	Upper- division social
	PSYC 10	Out of department course	PSYC 20
4th (senior)	PSYC 193/ PSYC 194/ PSYC 195	PSYC 193/ PSYC 194/ PSYC 195	Upper- division PSYC elective (seminar)
	Upper- division PSYC elective	PSYC 181/ PSYC 182	Upper- division PSYC elective
	Upper- division cognitiv e		

COGNITIVE SCIENCE B.S.

Information and Policies

Introduction

Academic Advising for the Program

The Psychology Department has an advising office located at 273 Social Sciences 2, (831) 459-2002, psyadv@ucsc.edu. The advisors assist students in obtaining information regarding major requirements and

petitions, course planning, substitution of transfer courses for advance enrollment, careers, and graduate schools. Students are encouraged to take advantage of the advising office throughout their college career. Transfer students are encouraged to consult the Transfer Information and Policy Section.

Getting Started in the Major

Students interested in pursuing the cognitive science major should complete PSYC 20, the statistics requirement, the calculus mathematics requirement, and the computer programming requirement. These classes should be taken for a letter grade. After completing these four lower-division required courses, students may petition to declare the cognitive science major subject to the grade requirements described in the Major Qualification section below.

High school students considering cognitive science as their university major find that the best preparation is a solid general education in English writing, mathematics at least through precalculus, biological and physical sciences, and social sciences.

Program Learning Outcomes

Students who complete the cognitive science major should demonstrate competency in:

- **Application of knowledge with critical thinking skills.** Students should be able to use critical thinking to evaluate and interpret evidence, and to apply cognitive science concepts, theories, and research findings to individual, social, and cultural issues.
- **Application of research methods with values and integrity.** Students should be able to apply basic research methods in cognitive science, with sensitivity to ethical principles.
- **Communication skills.** Students should be able to demonstrate effective communication skills following professional conventions in cognitive science appropriate to purpose and context.
- **Awareness of methodological and theoretical diversity.** Students should be able to understand the complexities of cognition using neural, embodied, social, and/or technological approaches.

Major Qualification Policy and Declaration Process

Major Qualification

Students may petition to declare the cognitive science major once they have completed the lower-division requirements (PSYC 20, the statistics requirement, the calculus requirement, and the computer programming requirement). For students to be admitted to the major, they must have a 2.80 or higher cumulative GPA in the lower-division requirements and receive a C or better in each of the courses. Transfer students may substitute

equivalent courses from other institutions. Students not meeting the grade requirements in the lower-division courses may take any of the listed alternatives as substitutions; the department will use the highest grade to compute GPA.

Appeal Process

Students who did not satisfy the major admission requirements but believe that there are extenuating circumstances concerning their performance in the foundational courses may file a written appeal describing these circumstances; however, such appeals are rarely granted. Appeals may be filed by emailing psyadv@ucsc.edu. The department will notify the student and college of the decision within 15 days of the receipt of the appeal.

How to Declare a Major

Students should submit a petition to declare as soon as they complete the major qualification (MQ) courses or reach their declaration deadline quarter, whichever comes first.

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed MQ courses.

To petition to declare the major, students should follow the instructions on the department's website.

Transfer Information and Policy

Transfer Admission Screening Policy

The following courses or their equivalents are required prior to transfer, by the end of the spring term for students planning to enter in the fall:

- Minimum grade of C (2.0) in a course articulated to a UC Santa Cruz calculus course (AM 11A/ECON 11A, MATH 11A, MATH 19A, or MATH 20A). (An AP Calculus AB score of 4 or 5, or Calculus BC score of 3, 4, or 5 can be substituted.)
- Minimum grade of C (2.0) in a course articulated to UCSC's PSYC 2, Introduction to Psychological Statistics, or STAT 5, or STAT 7 & STAT 7L, Statistics. (An AP Statistics score of 4 or 5 can substitute for PSYC 2 or STAT 5.)
- Minimum grade of C (2.0) in a course articulated to one of the following UCSC programming courses (An AP Computer Science A score of 3, 4, or 5 can be substituted for the programming requirement): ECE 13, CSE 13S, CSE 20, or CSE 30.

A minimum GPA of 2.8 must be obtained in the courses listed above.

In addition, the following courses are recommended prior to transfer to ensure timely graduation:

- PSYC 20, Cognition: Fundamental Theories

Prospective students are also encouraged to complete the Intersegmental General Education Transfer Curriculum (IGETC) or to complete all UC Santa Cruz general education requirements before matriculation.

Getting Started at UCSC as a Transfer Student

Transfer students who satisfy the requirements of the screening policy can declare the major at any time after matriculation at UC Santa Cruz. See the How to Declare the Major Section.

Letter Grade Policy

All lower-division courses required for the major declaration have to be taken for a letter grade.

[Optional Catchall]

Course Substitution Policy

Students who want to fulfill requirements with courses taken at other colleges must petition for the substitution of their transfer courses at an orientation session or at an appointment with the department advisor. PSYC 100, Research Methods in Psychology, and the senior seminar must be taken at UC Santa Cruz. Students planning to transfer to UC Santa Cruz should check with the advising office of their present college, or refer to assist.org.

Double Majors and Major/Minor Combinations Policy

Students wishing to pursue double majors or a major/minor combination are encouraged to meet with an advisor to create an academic plan to do so.

Study Abroad

Up to three courses taken through UC Santa Cruz study abroad may be approved for the major, and prior course approval is recommended. Please review this webpage if you are considering studying abroad and want to try to obtain approval for such courses to count toward the major.

Honors

Honors in the cognitive science major are awarded to graduating seniors whose UC Santa Cruz grade point average is a 3.6 or higher in psychology courses (1-189).

Highest honors in the major are reserved for students who meet the honors criteria as well as successful completion of a senior thesis, or whose UC Santa Cruz grade point average is a 3.9 or higher in psychology courses (1-189).

Research and Other Educational Opportunities

The Psychology Department offers a range of educational opportunities, including opportunities for undergraduate research. For more information, see the department's educational opportunities website.

Requirements and Planners**Course Requirements**

The undergraduate degree program in cognitive science is a program offering a course of study leading to the bachelor of science (B.S.) degree. Fifteen courses (77 credits) are required. Because some courses have additional prerequisites, students should read the descriptions of courses carefully, noting the prerequisites for courses of interest to them.

Lower-Division Courses**Introduction to Cognition**

Take the following course:

PSYC 20	Cognition: Fundamental Theories	5
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Statistics

Choose one of the following courses:

Either this course		
PSYC 2	Introduction to Psychological Statistics	5
or this course		
STAT 5	Statistics	5
or these courses		
STAT 7	Statistical Methods for the Biological, Environmental, and Health Sciences	5
STAT 7L	Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory	2

Lecture and lab combinations count as a single course.

Calculus

Choose one of the following courses:

AM 11A	Mathematical Methods for Economists I	5
MATH 11A	Calculus with Applications	5
MATH 19A	Calculus for Science, Engineering, and Mathematics	5
MATH 20A	Honors Calculus	5

Computer Programming

Choose one of the following courses:

CSE 13S	Computer Systems and C Programming	7
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CSE 20	Beginning Programming in Python	5
CSE 30	Programming Abstractions: Python	7
ECE 13	Computer Systems and C Programming	7

Some of these courses have prerequisites.

Upper-Division Courses

Take the following course:

PSYC 100	Research Methods in Psychology	7
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Core Courses

Students must complete a course from three of the four following areas:

Perception

PSYC 120	Visual and Spatial Cognition	5
PSYC 121	Perception	5

Neuroscience

PSYC 123	Cognitive Neuroscience	5
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Language

PSYC 125	The Psychology of Language	5
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Memory

PSYC 129	Human Learning and Memory	5
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Electives**Cognitive Psychology Electives**

Students must complete three additional upper-division psychology courses.

One Cognitive Senior Seminar from the following list:

PSYC 119E	The World of Babies	5
PSYC 119F	Language Development	5
PSYC 119P	Children and Technology	5
PSYC 139B	Consciousness	5
PSYC 139D	Modeling Human Performance	5
PSYC 139F	Psychology and Evolutionary Theory	5
PSYC 139G	Eye-tracking: A Window into Cognition	5
PSYC 139H	Weird Science	5
PSYC 139J	Forgetting	5
PSYC 139K	Face Recognition	5
PSYC 139L	Illusions	5
PSYC 139M	Human-Robot Interaction	5
PSYC 139N	Diversity in Cognitive Psychology	5

PSYC 139P	Natural and Artificial Intelligence	5
PSYC 139Q	Analogy and Transfer	5
PSYC 179E	Psychology of Emotion	5
PSYC 179F	The Path to a Science of Dreaming	5

Plus two additional courses from the following list:

PSYC 103	Adult Development and Aging	5
PSYC 104	Development in Infancy	5
PSYC 105	Children's Thinking	5
PSYC 112	Moral Development	5
PSYC 116	Communication Technologies, Culture, and Human Development	5
PSYC 120	Visual and Spatial Cognition	5
PSYC 120D	Deafness and Sign Language	5
PSYC 121	Perception	5
PSYC 122	The Science of Learning	5
PSYC 123	Cognitive Neuroscience	5
PSYC 124	Psychology of Reading	5
PSYC 125	The Psychology of Language	5
PSYC 126	Conversations	5
PSYC 127	Computer Mediated Communication	5
PSYC 128	Human Factors	5
PSYC 129	Human Learning and Memory	5
PSYC 130	Deception, Brain, and Behavior	5
PSYC 132	Neural Modeling	5
PSYC 133	Bilingualism from a Cognitive Perspective	5
PSYC 135	Feelings and Emotions	5
PSYC 137	Mind, Body, and World	5
PSYC 138	Computer Programming for the Cognitive Sciences	5
PSYC 138M	Introduction to Matlab Programming for the Cognitive Sciences	5
PSYC 140F	Mind, Society, and Culture	5
PSYC 147A	Psychology and Law	5
PSYC 181	Psychological Data Analysis	5
PSYC 194B	Research Internship in Cognitive Psychology	5
PSYC 195A	Senior Thesis	5

One of these may be replaced by a core course that was not used to satisfy the core courses requirement. PSYC 204-PSYC 252, graduate cognitive courses, may be substituted by petition.

Interdisciplinary Electives

Students must complete four interdisciplinary electives from lists of courses pre-approved by the Psychology Department, at least one of which must be upper-division. The electives fall into four groups: Evolution; Artificial Intelligence and Human-Computer Interaction; Linguistics; Philosophy. Three of the four electives must be selected from the same group. Students are responsible for planning their course of study to complete any necessary prerequisites for electives they wish to take. Possible sequences of interdisciplinary courses, including prerequisites, are given below.

Group 1: Evolution

ANTH 1	Introduction to Biological Anthropology	5
ANTH 100	History and Theory of Biological Anthropology	5
ANTH 101	Human Evolution	5
ANTH 104	Human Variation and Adaptation	5
ANTH 105	Human Paleopathology	5
ANTH 106	Primate Behavior and Ecology	5
ANTH 109	Evolution of Sex	5
ANTH 112	Life Cycles	5
ANTH 139	Language and Culture	5
ANTH 173	Origins of Farming	5
ANTH 174	Origins of Complex Societies	5
ANTH 184	Zooarchaeology	5
ANTH 184L	Zooarchaeology Laboratory	2
ANTH 194B	Chimpanzees: Biology, Behavior, and Evolution	5
ANTH 194H	Paleoanthropology	5
BIOE 20C	Ecology and Evolution	5
BIOE 109	Evolution	5
BIOE 124	Mammalogy	5
BIOE 124L	Mammalogy Laboratory	2
BIOE 129	Biology of Marine Mammals	5
BIOE 129L	Biology of Marine Mammals Laboratory	2
BIOE 140	Behavioral Ecology	5
BIOE 141L	Behavioral Ecology Field Course	5
BIOE 147	Community Ecology	5
BIOE 172	Population Genetics	5
BIOE 172L	Population Genetics Laboratory	2
BIOL 80E	Evolution	5
BIOL 105	Genetics	5
BIOL 120	Developmental Biology	5
BIOL 125	Introduction to Neuroscience	5
PHIL 127	Philosophy of Biology	5
PHIL 190	Senior Seminar	5

Lecture and lab combinations count as a single course.

ANTH 139 also listed in Group 3

PHIL 127 also listed in Group 4

PHIL 190 also listed in Group 4

Group 2: Artificial Intelligence and Human-Computer Interaction

ARTG 80H	Critical History of Digital Games	5
CMPM 25	Introduction to 3D Modeling	5
CMPM 26	Introduction to 3D Animation	5
CMPM 35	Data Structures for Interactive Media	5
CMPM 80A	Accessible Games	5
CMPM 80K	Foundations of Video Game Design	5
CMPM 121	Game Technologies	5
CMPM 131	User Experience for Interactive Media	5
CMPM 146	Game AI	5
CMPM 148	Interactive Storytelling	5
CMPM 177	Creative Strategies for Designing Interactive Media	5
CMPM 178	Human-Centered Design Research	5
CSE 107	Probability and Statistics for Engineers	5
ECE 8	Robot Automation: Intelligence through Feedback Control	5
ECE 9	Statics and Mechanics of Materials	5
ECE 167	Sensing and Sensor Technologies	7
ECE 167L	Sensing and Sensor Technologies Lab	2
MUSC 80L	Artificial Intelligence and Music	5

Lecture and lab combinations count as a single course.

The upper-division School of Engineering courses in this section have additional prerequisites that are not listed here.

Group 3: Linguistics

ANTH 139	Language and Culture	5
LING 50	Introduction to Linguistics	5
LING 53	Semantics I	5
LING 80C	Language, Society, and Culture	5
LING 80D	Language and Mind	5
LING 101	Phonology I	5
LING 102	Phonology II	5
LING 105	Morphology	5
LING 111	Syntactic Structures	5
LING 112	Syntax I	5
LING 113	Syntax II	5
LING 116	Semantics II	5
LING 117	Pragmatics	5

LING 124	Language Typology	5
LING 125	Foundations of Linguistic Theory	5
LING 140	Language Change	5
LING 151	Phonetic Analysis	5
LING 152	Applied Phonetics	5
LING 155	Language and Cognition	5
LING 157	Psycholinguistics and Linguistic Theory	5
LING 158	Advanced Psycholinguistics	5

ANTH 139 also listed in Group 1

LING 111 formerly LING 55

LING 112 formerly LING 52

Group 4: Philosophy

PHIL 9	Introduction to Logic	5
PHIL 11	Introduction to Philosophy	5
PHIL 80S	The Nature of Science	5
PHIL 100B	The Rationalists	5
PHIL 100C	The Empiricists	5
PHIL 121	Epistemology	5
PHIL 123	Philosophy of Language	5
PHIL 125	Philosophy of Science	5
PHIL 127	Philosophy of Biology	5
PHIL 133	Philosophy of Mind	5
PHIL 135	Philosophy of Psychology	5
PHIL 190	Senior Seminar	5

PHIL 127 also listed in Group 1

PHIL 190 satisfies this requirement by petition only

Disciplinary Communication (DC) Requirement

and one of the following seminar courses: Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement in cognitive science is satisfied by completing PSYC 100, Research Methods in Psychology, and one of the following seminar courses:

PSYC 119E	The World of Babies	5
PSYC 119F	Language Development	5
PSYC 119P	Children and Technology	5
PSYC 139B	Consciousness	5
PSYC 139D	Modeling Human Performance	5
PSYC 139F	Psychology and Evolutionary Theory	5
PSYC 139G	Eye-tracking: A Window into Cognition	5
PSYC 139H	Weird Science	5
PSYC 139J	Forgetting	5
PSYC 139K	Face Recognition	5
PSYC 139L	Illusions	5
PSYC 139M	Human-Robot Interaction	5
PSYC 139N	Diversity in Cognitive Psychology	5

PSYC 139P	Natural and Artificial Intelligence	5		elective		
PSYC 179F	The Path to a Science of Dreaming	5	4th (senior)	Interdisciplinary elective	Cognitive elective (seminar)	Cognitive elective
PSYC 139Q	Analogy and Transfer	5				
PSYC 139R	Social Frames of Memory	5				
PSYC 179E	Psychology of Emotion	5				

Comprehensive Requirement

UC Santa Cruz requires that every student satisfy a senior exit/comprehensive requirement prior to graduation. Cognitive Science students will satisfy this requirement by receiving a passing grade in a cognitive science seminar which is also part of the DC requirement (see above). To ensure that all students can meet the seminar requirement, students are encouraged to enroll in only one senior seminar. Students would only be allowed to enroll in additional seminars after all who still need to fulfill their seminar requirement have enrolled.

Planners

Following are two recommended academic plans for frosh, and one for transfer students to complete the Cognitive Science major. Plan 1 (for frosh) assumes typical curriculum selections. Plan 2 (for frosh) includes two additional interdisciplinary prerequisites, which some students find they need in order to take the upper-division courses they desire. Students who place out of MATH 2 and MATH 3 do not need these courses, which are otherwise prerequisites to Calculus, PSYC 2 and PSYC 100.

Frosh Plan One

Year	Fall	Winter	Spring
1st (frosh)	MATH 2 PSYC 20	MATH 3 Programming	Calculus
2nd (soph)	Interdisciplinary prerequisite	PSYC 2 Interdisciplinary prerequisite	PSYC 100
3rd (junior)	Cognitive core Interdisciplinary elective Cognitive	Cognitive core Interdisciplinary elective (UD)	Cognitive core Interdisciplinary elective

The courses listed above will satisfy the SR, and DC general education requirements. All other GE requirements have to be satisfied.

Frosh Plan Two

Year	Fall	Winter	Spring
1st (frosh)	MATH 2 PSYC 20	MATH 3 Programming	Calculus
2nd (soph)	Interdisciplinary prerequisite	PSYC 2 Interdisciplinary prerequisite	PSYC 100 Interdisciplinary prerequisite
3rd (junior)	Cognitive core Interdisciplinary prerequisite	Cognitive core Cognitive elective	Cognitive core
4th (senior)	Cognitive elective Cognitive elective (seminar) Interdisciplinary elective	Interdisciplinary elective (UD) Interdisciplinary elective	Interdisciplinary elective

The courses listed above will satisfy the SR, and DC general education requirements. All other GE requirements have to be satisfied.

Transfer Plan

Year	Fall	Winter	Spring
3rd (junior)	PSYC 20	Cognitive core	Cognitive core

or)	PSYC 100	Interdiscipl inary elective	Interdiscipl inary elective
4th (seni or)	Cognitive elective	Cognitive core	Cognitive elective (seminar)
	Interdiscipl inary elective	Cognitive elective	Interdiscipl inary elective (upper- division)

opportunity as people engage across contexts of family, peers, school, community, technology, and media. Our programs of research include moral and emotional development; neurodiversity; language and cognitive development; learning through observation and social interaction; children and playable media; personal and social identities; family and peer relationships; communication technologies; prejudice and discrimination; gender development; adolescent development; the transition to adulthood; school climate and motivation; and diversity issues in university outreach programs. Several of our faculty carry out research in cultural communities outside the U.S. and collaborate with faculty in the U.S. and other nations. At UC Santa Cruz, our interdisciplinary collaborations with other programs (such as computer engineering, computational media, education, Latin American and Latino studies, linguistics, and philosophy) help nurture students' research and prepare them for a wide variety of careers. Graduates of our program have accepted positions in academia, research institutes, and community and non-profit organizations.

PSYCHOLOGY PH.D.

Introduction

The psychology program offers three areas of specialization leading to the doctoral degree: cognitive, developmental, and social psychology. The program prepares students for research, teaching, and administrative positions in colleges and universities as well as for positions in schools, government, and other public and private institutions. Each student is primarily associated with one of the three research areas and participates in the courses and research forums sponsored by the faculty in that area. The program requires full-time enrollment as a graduate student. Although applicants for a master's degree are not accepted, students in the doctor of philosophy (Ph.D.) program may obtain a master of science (M.S.) degree by fulfilling specific requirements. Note that the program does not offer courses, training, or supervision in clinical psychology.

The cognitive psychology graduate program focuses on research of "Minds, Brains, and Beyond," offering a blend of traditional topics and new directions in cognitive science. With core strengths in language and interaction, memory and learning, and perception and performance, we are exploring topics such as: reading, speaking, psycholinguistics, discourse processing; language production and comprehension; bilingualism and multilingualism; remembering and forgetting; metacognition in learning and memory; creative cognition; cognitive offloading and transactive memory; socially distributed remembering and collective memory; human performance, information processing, and computational cognitive modeling; working memory and executive control; visual psychophysics; face perception; sensory integration; perception in virtual reality; cognitive and computational neuroscience; perceptual decision-making, attention, and awareness. Our graduates find careers in academia, tech industries, and more.

The developmental psychology graduate program focuses on research that integrates cultural, interpersonal, and individual aspects of human development. We focus especially on issues of diversity in relation to culture, ethnicity, race, gender, sexuality, and social economic

The social psychology graduate program at UC Santa Cruz has a unique mission and focus. We use Kurt Lewin's model of "full-cycle" social psychology (theory-application-action) to study a broad range of topics related to social justice. In this way, knowledge gained in action-oriented research leads, in turn, to the development of new theory. Accordingly, our students learn to apply psychological theories and data to the analysis and solution of a wide range of social problems. We use a variety of research methods to examine justice-related issues in different cultural, political, and policy contexts. Our students are trained in laboratory, field, and survey methods; they are encouraged to attend to issues of race, class, sexuality, ethnicity, gender, and physical ableness; and, in addition to traditional social psychological approaches, are steeped in critical theoretical perspectives such as feminist theory. Our graduates go on to successful careers in academia as well as in community, government, and non-profit settings. Our approach to research and training, combined with the quality and competencies of our faculty, make our program among the nation's best for the psychological study of social justice issues. Current faculty research interests include: aggression and trauma; educational quality/access; achievement and disparities; feminisms; institutional analysis; intersectionality; narrative and identity; race as a social process; social identities and stigmatization of immigrant-origin students; poverty and economic justice; power and oppression; psychology and law; sexual and gender diversity; sexuality; social identity; social policy analysis; and structural inequality.

Graduate students in psychology may obtain a designated emphasis on the psychology Ph.D. diploma indicating that they have obtained additional training in another discipline such as feminist studies, Latin American and Latino studies, or sociology. For the full list of programs that offer a designated emphasis, see the Fields of Study section of the catalog. For specific requirements for a

designated emphasis in a program, please refer to the program statement for that department.

Details on the policies for admission to graduate standing and requirements for the Ph.D. degree, as well as the online application can be found on the Division of Graduate Studies website. The department's graduate program brochure, and faculty research are available on the department website.

Advancement to Candidacy

Course Requirements

First-Year and Second-Year Project:

Students enrolled in the psychology graduate program will complete a first-year and second-year research project. All students must enroll and participate in the colloquium series in their graduate program each quarter that they are in residence.

PSYC 230	Research in Cognitive Psychology Seminar	5
PSYC 231	Research in Social Psychology Seminar	5
PSYC 242	Research in Developmental Psychology Seminar	5

Statistics

First-year students must take two courses in statistics:

PSYC 204	Quantitative Data Analysis	5
PSYC 214A	Multivariate Techniques for Psychology	5

Plus a Two-Quarter Proseminar Sequence During Fall and Winter Quarters

For Cognitive

PSYC 224A	Proseminar: Cognitive I	5
PSYC 224B	Proseminar: Cognitive II	5
PSYC 224C	Proseminar: Cognitive III	5

For Developmental

PSYC 244A	Proseminar I: Cognitive and Language Development	5
PSYC 244B	Proseminar II: Social and Personality Development	5

Additional Requirements for the Developmental Area

PSYC 225A	Introduction to Developmental Research I	3
PSYC 225B	Introduction to Developmental Research II	3
PSYC 225C	Introduction to Developmental Research III	5
PSYC 246	Cultural Diversity in Human Development	5

For Social

PSYC 211A	Proseminar: Social Justice and the Individual	5
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PSYC 211B	Social Justice, Society, and Policy	5
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Additional Requirements for the Social Area

Both of these courses

PSYC 210	The Experimental Method in Social Psychology	5
PSYC 248	Survey Methods	5

Plus four additional courses

One other advanced social graduate seminar; a graduate course in cognitive psychology; a graduate course in developmental psychology; and a substantive advanced course in a discipline other than psychology.

Plus one of the following

PSYC 249	Field Methodologies and Social Ethnography	5
PSYC 255	Qualitative Inquiry in Psychology	5
PSYC 261	Participatory Action Research	5

Letter Grade

Students are required to take their graduate courses as satisfactory/unsatisfactory.

Foreign Language Requirements

Teaching Requirements

Students are required to serve as a teaching assistant for at least two courses during their graduate career (one of which must be PSYC 10 for developmental and PSYC 40 for social).

Pre-Qualifying Requirements

Qualifying Examination

After satisfying the formal course and research requirements, psychology graduate students must take an oral examination to qualify as a candidate for the Ph.D., ideally by the end of their third year. The qualifying examination is intended to assess a student's knowledge of psychology and competence to conduct the dissertation research. For the qualifying examination, students write a major paper that reflects a conceptual analysis of their main research area, prepare a list of readings representative of their expertise in three areas of psychology, and satisfactorily complete an oral qualifying examination.

Post-Qualifying Requirements

[Optional Catchall]

Dissertation

Dissertation

Within a year of advancing to candidacy, students will prepare a written dissertation proposal that should

demonstrate the student's in-depth knowledge of some research topic, along with a detailed outline of the empirical research to be conducted for the dissertation. The student's dissertation committee reviews the proposal, and the student will orally defend the proposal for approval by the committee.

Dissertation Defense

After the final draft of the dissertation has been completed and submitted to the faculty committee members, students must defend their thesis in an oral exam.

The Ph.D. degree is awarded upon successful completion and submission of the dissertation.

Academic Progress

Applying for Graduation

[Optional Catchall]

Sociology

226 Rachel Carson College
(831) 459-4888
<https://sociology.ucsc.edu/>

PROGRAMS OFFERED

Sociology B.A. (p. 711)

Global Information and Social Enterprise Studies Minor
(p. 717)

Sociology Ph.D. (p. 718)

Sociology Designated Emphasis (p. 720)

OTHER PROGRAMS OF INTEREST

Latin American and Latino Studies/Sociology Combined B.A. (p. 672)

Sociology is the study of social interactions among individuals and social groups. More specifically, sociologists examine the cultural, ideological, economic and political contexts of human action including the processes whereby social institutions are created, maintained, and transformed.

Sociology was born as an intellectual response to the democratic and industrial revolutions that ushered in the modern era. As such, it considers how society is organized in relationship to a vision of a just, free, and equal society—a vision that may require fundamental social change. Developing an understanding of both social change and social justice as part of the sociological tradition is one of the teaching goals of sociologists at UCSC. In the process, we expect to develop in students an appreciation for the craft of social science: disciplined

inquiry, observation, and research as part of informed global citizenship.

Our faculty have expertise in topics that include, but are not limited to:

- Children, youth, and families
- Civic engagement, voting, and citizenship
- Community-engaged research
- Cultural politics and the politicization of culture
- The cultural politics of sex work
- Critical ethnography
- Drugs, botanicals, and pharmaceuticals in society
- Educational inequality
- Education (K-12 and higher education)
- Environmental sociology
- Feminist studies
- Global and community health
- Global inequality, crime, and deviance
- Globalization and international development
- Health and medicine
- Human rights and health justice
- Identities and identity changes
- International law
- The intersection of race, class, gender and sexualities
- Labor studies
- Latinx communities
- Law and society
- Medicine and technology
- Mass media and digital technology
- Immigration and migration
- Political economy
- Popular culture and cultural studies
- Public policy
- Queer studies
- Science and technology
- Social movements
- Sociology of emotion and affect

- Survey design and quantitative data analysis
- Sustainability
- Technology and social change
- Traditional and holistic medicine
- Urban studies

Sociology faculty use a number of approaches and methods, including field research, critical ethnography, cultural analysis, comparative historical analysis, and quantitative techniques.

UNDERGRADUATE PROGRAM

The sociology major at UC Santa Cruz is a rigorous program of study that retains enough flexibility to accommodate students with diverse career goals and plans. It ensures that all students are trained in the main theoretical and methodological traditions of sociology, yet permits considerable variation in students' own areas of specialization. The major provides the necessary intellectual foundation for students who are considering graduate studies in sociology and related social sciences. It also can be used as preparation for careers in fields as diverse as law, social work, management, environmental planning, public service, education, health services, journalism, and counseling. Finally, the sociology major can provide a general liberal arts education for undergraduates interested in the study of contemporary society and social problems.

Because of the interdisciplinary emphasis among sociology faculty, undergraduates find the department amenable for double majors and minors, and non-majors find many sociology courses of interest. In recent years, students have conducted independent studies and written senior theses on a variety of subjects including undocumented immigrants, cultural diversity and inclusion in education, low-wage workers in Santa Cruz County, housing shortage, social inequality and immunology, economic inequality and mental health, surveillance state and national security, feminism, music and race, homeless shelter services, domestic violence, inclusive education, the Pelican Bay Prison hunger strike, participatory culture in the 2016 presidential campaign, social media, the school-to-prison pipeline, mental illness, and community empowerment.

The Sociology Department offers two undergraduate majors: 1) a general sociology major; 2) a sociology with a concentration in global information and social enterprise studies (GISES) intensive major. Students also have the option of a combined major in Latin American and Latino studies (LALS) and sociology, which can be found through the LALS Department. Additionally, there is a minor in GISES that is open to students in any major.

GLOBAL INFORMATION AND

SOCIAL ENTERPRISE STUDIES

Sponsored by the Sociology Department at UC Santa Cruz is Global Information and Social Enterprise Studies (GISES), a rigorous and innovative program developed in collaboration with the Everett Program for Technology and Social Change. It aspires to create a new generation of well-trained advocates for social justice and sustainable development, who use the tools of information technology and social enterprise to solve global problems. Practically, students develop projects in solidarity with local and global organizations to democratize globalization, deepen social justice, reduce poverty, support digital education, and advance the transition to a sustainable world. The Everett Program combines social entrepreneurship with peer-to-peer and near-to-peer trainings in information technologies with the aim that students learn how to be innovative and creative problem-solvers in order to increase the informational, communication and organizational capacity of community and non-governmental organizations (NGOs). The GISES program provides an excellent foundation for students pursuing careers in non-profit management, social advocacy, sustainable businesses, and technology. Depending on a student's major, there are two ways to enter the GISES program. If a student is a sociology major and wishes to participate in GISES, they should declare the sociology with concentration in GISES intensive major. A student who majors in any field other than sociology should declare GISES as a minor.

SOCIOLOGY B.A.

Information and Policies

Introduction

Academic Advising for the Program

For sociology-related advising inquiries contact:

socyadvising@ucsc.edu
831-459-4888

Visit the sociology website for additional advising information, including advising hours, appointments, and peer advising.

Sociology advising is located in Rachel Carson College Academic Building, Rm 226.

Transfer students must also review the Transfer Information and Policy section below.

Getting Started in the Major

Program Learning Outcomes

The sociology curriculum prepares students graduating with a bachelor of arts degree to demonstrate the following program learning outcomes:

1. **Critical Thinking:** Demonstrate critical thinking skills by analyzing and evaluating social, political, and/or cultural arguments, across a variety of areas such as inequality; social problems; and race, class, and gender.
2. **Sociological Understanding:** Demonstrate sociological understandings of phenomena, for example, how individual biographies are shaped by social structures, social institutions, cultural practices, and multiple axes of difference and/or inequality.
3. **Written and Oral Communication:** Formulate effective and convincing written and/or oral arguments.
4. **Social Theory:** Demonstrate the ability to use several of the major classical or contemporary perspectives in social theory.
5. **Research Methodology:** Demonstrate the ability to use several of the major social science research methodologies.

Major Qualification Policy and Declaration Process

Major Qualification

General Sociology Major

Students must take two of the following courses, and pass each with C+ or better, to qualify:

SOCY 1	Introduction to Sociology	5
SOCY 10	Issues and Problems in American Society	5
SOCY 15	World Society	5

Students who are transferring in should also refer to the section below, Transfer Information and Policy, on the major selection criteria used during the admissions screening process.

Sociology with a Concentration in GISES Intensive Major

Students must take three courses, for a letter grade, to qualify for the sociology with a concentration in Global Information and Social Enterprise Studies (GISES) intensive major. The following course is required:

SOCY 30A	Introduction to Global Information and Social Enterprise Studies	5
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Plus two of the following courses

SOCY 1	Introduction to Sociology	5
SOCY 10	Issues and Problems in American Society	5
SOCY 15	World Society	5

Students are required to pass each of the courses with a B- or better, and obtain approval from the faculty director, to qualify for the GISES concentration. Students will begin the approval process while enrolled in SOCY 30A. Prior to enrollment into the second course in the series, SOCY 107A, the faculty director works with

students to ensure there is an appropriate match between student interests and project partners.

How to Declare a Major

Students should submit a petition to declare by completing the sociology online declaration form as soon as they complete the major qualification courses or reach their declaration deadline quarter, whichever comes first.

Students petitioning when the campus declaration deadline is imminent (i.e., in their sixth quarter, for students admitted as frosh), will either be approved, denied, or provided with conditions (e.g., completion of some courses with certain grades) that will be resolved within at most one more enrolled quarter, even if they have not completed courses.

Students pursuing a double major or major/minor must also work with the department advising office to create an academic plan for the major. For information about the declaration process please review the Sociology Department website.

Appeal Process

Students who are informed that they are not eligible to declare the major may appeal this decision by submitting a letter to the Sociology Department Undergraduate Education chair within 15 days from the date of notification. Within 15 days of receipt of the appeal, the department will notify the student and college of the decision. Letters of appeal should describe any extenuating circumstances that might have affected the student's record. Students should submit the appeal letter via email to socyadvising@ucsc.edu or in-person to the Sociology advising office, located in Rachel Carson College Academic Building, Room 226. Students may contact the sociology undergraduate advisor for any questions.

Transfer Information and Policy

Transfer Admission Screening Policy

The following courses or their equivalents are required prior to transfer, by the end of the spring term for students planning to enter in the fall:

SOCY 1	Introduction to Sociology	5
SOCY 10	Issues and Problems in American Society	5

A minimum GPA of 2.0 (C) or better must be obtained in the courses listed above.

Getting Started at UCSC as a Transfer Student

Transfer students who meet the selection criteria and are offered admission are admitted as proposed sociology majors. They must work with the sociology undergraduate coordinator when they arrive on campus to begin the process to declare the major. Declaration of the major for transfer students must be completed by the campus declaration deadline, in the second term of residency.

Students who are proposed in a different major and have advanced standing when they come to UC Santa Cruz require permission from the department to change into the major.

If a student enters in the winter quarter, they are required to have taken SOCY 3A or its articulated equivalent at their previous institution. If possible, having taken SOCY 3B or its equivalent is recommended to ensure timely graduation.

If a student enters in the fall quarter as a proposed sociology major, they must take SOCY 3A at UC Santa Cruz that quarter if they have not satisfied the articulated equivalent at their previous institution.

If a student transfers in either fall or winter quarter and they have already taken SOCY 3A or its articulated equivalent at their previous institution, they are recommended to take SOCY 105A in their quarter of entry.

In addition, transfer students who are pursuing the GISES intensive concentration must take SOCY 30A in fall quarter as it is the start of a yearlong course series.

Letter Grade Policy

All major qualification courses must be taken for letter grades. All other major requirements may be taken as a letter grade or Pass/No Pass. No more than 25 percent of credits earned at UCSC may be graded on a Pass/No Pass basis. Students must be in good academic standing to choose the Pass/No Pass option.

[Optional Catchall]

Course Substitution Policy

Sociology B.A. students may substitute two of the upper-division elective requirements with upper-division electives from other UCSC departments, individual study courses, education abroad electives, or other four-year institution electives. Students are limited in the number of outside electives accepted toward the major and must petition for approval of the course prior to applying it to the major. Review the sociology webpage for information about the petition process.

Double Majors and Major/Minor Combinations Policy

Study Abroad

Students seeking to study abroad must be declared in their major prior to studying abroad.

It is recommended that the students have the courses intended to be taken abroad reviewed and approved by the Sociology Department prior to departure, if possible. Up to two relevant courses taken through study abroad programs from which credits are transferable to UCSC may be used toward satisfaction of the sociology B.A. elective requirements when the content is deemed appropriate and approved by the Sociology Department.

Up to five relevant courses taken through study abroad programs from which credits are transferable to UCSC may be used toward satisfaction of the sociology B.A. with a concentration in GISES intensive major elective requirements when the content is deemed appropriate and approved by the Everett/GISES program faculty director.

Visit the sociology webpage for additional information and planners for study abroad.

Honors

The Sociology Department awards honors in the major based on the student's cumulative GPA for all courses taken to satisfy the program's major requirements. Students with a GPA of 3.75 or above will be considered for honors in the major. Students with a GPA of 3.9 or above will be considered for highest honors in the major. No more than approximately 15 percent of the graduating class will be considered for honors or highest honors in the major. Comprehensive honors is awarded to students who complete the senior thesis option, and their faculty thesis sponsor and one additional reader evaluate the thesis to be of honors quality.

[Optional Catchall]

General Sociology Major

Course Requirements

Sociology majors are required to take a total of 11 courses (two lower-division courses in preparation for the major, two prescribed lower-division core courses, two prescribed upper-division core courses, and five upper-division electives). In addition, they must successfully complete the comprehensive requirement prior to graduation.

Lower-Division Courses

Lower-division preparation:

All sociology majors are required to take two lower-division preparation courses, or their articulated equivalents.

Select two from the following three courses:

SOCY 1	Introduction to Sociology	5
SOCY 10	Issues and Problems in American Society	5
SOCY 15	World Society	5

Lower-division core courses:

The following two sociology courses, or their articulated equivalents, are required as the foundation of statistical and research methods in the discipline.

SOCY 3A	The Evaluation of Evidence	5
SOCY 3B	Statistical Methods	5

Upper-Division Courses

Upper-division core courses:

The following two sociology courses are required as the foundation of theoretical training in the discipline.

SOCY 105A	Classical Social Theory	5
SOCY 105B	Contemporary Social Theory	5

Upper-division advanced coursework:

Five upper-division sociology electives are required. The Sociology Department offers upper-division electives that reflect a wide range of ideas within the discipline and the diversified research interests of the faculty. All upper-division electives offered by the department are numbered Sociology 110-189. The annual course offerings can be viewed on the sociology webpage.

Electives

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The goal of the Sociology Department's Disciplinary Communication requirement is to ensure that students acquire and develop the skills in writing and other forms of communication that will best serve them in their study of sociology, and as future learners. The following courses satisfy the Disciplinary Communication requirement for students in programs administered by the Sociology Department.

SOCY 105A	Classical Social Theory	5
SOCY 105B	Contemporary Social Theory	5

Comprehensive Requirement

Prior to graduation, all sociology majors are required to complete one of the following comprehensive requirements.

Senior Seminar

SOCY 196S	Senior Seminar	5
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Sociology Graduate Course

Students may satisfy the comprehensive requirement by successfully completing a graduate-level sociology course, numbered SOCY 201-SOCY 294. Enrollment into a graduate-level sociology course is by invitation or approval of the course instructor.

Senior thesis

SOCY 195A	Senior Thesis	5
SOCY 195B	Senior Thesis	5
SOCY 195C	Senior Thesis	5

Planners

Sociology Major Planner One

The following is a recommended academic plan for students in the sociology major.

Option One

Year	Fall	Winter	Spring
1st (frosh)	SOCY 1	SOCY 10	
2nd (soph)	SOCY 3A	SOCY 3B	
3rd (junior)	SOCY 105A	SOCY 105B	SOCY upper-division elective
4th (senior)	SOCY upper-division elective	SOCY upper-division elective	SOCY 196S or SOCY graduate course (or in fall or winter) (or thesis fall-winter-spring)

Year	Fall	Winter	Spring
1st (frosh)			SOCY 1
2nd (soph)	SOCY 15		
3rd (junior)	SOCY 3A	SOCY 3B	SOCY upper-division

	SOCY upper-division elective	SOCY upper-division elective	elective		in fall or winter) (or thesis fall-winter-spring)
4th (senior)	SOCY 105A	SOCY 105B	SOCY 196S or SOCY graduate course (or in fall or winter) (or thesis fall-winter-spring)	SOCY upper-division elective	
	SOCY upper-division elective	SOCY upper-division elective			

*Articulated equivalent courses may be taken prior to transfer.

Option Two

Year	Fall	Winter	Spring
1st (junior)	SOCY 3A*	SOCY 3B*	SOCY upper-division elective
	SOCY 105A	SOCY 105B	SOCY upper-division elective

All sociology majors are required to take SOCY 3B which also satisfies the SR general education (GE) requirement. SOCY 15, which satisfies the CC GE, may be selected as one of the major qualification course options. In addition, students may satisfy the CC, ER, TA, and PE GE requirements by selecting certain upper-division sociology electives. Visit the Office of the Registrar's website for an up-to-date list of the sociology upper-division electives that satisfy GE requirements. The IM, MF, SI, PR and composition GE requirements are not offered through the sociology department.

Sociology Major Planner Two

The following is a recommended academic plan for transfer students entering the sociology major. It is assumed that SOCY 1 and SOCY 10 equivalencies were completed at the previous college.

Option One

Year	Fall	Winter	Spring
1st (junior)	SOCY 3A*	SOCY 3B*	SOCY 105B
	SOCY upper-division elective	SOCY 105A	SOCY upper-division elective
2nd (senior)	SOCY upper-division elective	SOCY upper-division elective	SOCY 196S or SOCY graduate course (or

2nd (senior)	SOCY upper-division elective	SOCY upper-division elective	SOCY 196S (or in fall or winter) (or thesis fall-winter-spring)
	SOCY upper-division elective		

*Articulated equivalent courses may be taken prior to transfer.

Sociology with Concentration in GISES Intensive Major

The GISES intensive concentration is an option for students wishing to major in sociology and focus in the area of Global Information and Social Enterprise Studies (GISES). The major is sponsored and administered by the Department of Sociology. This major is designed for highly motivated, self-directed and enterprising students who have demonstrated the capacity to design and complete an honors-quality project for a civil society group. Students are required to take a total of 15 courses (three prescribed lower-division courses in preparation for the major, two prescribed lower-division core courses, two prescribed upper-division GISES courses, two prescribed upper-division core courses, five upper-

division electives, and a project practicum course). In addition, they must successfully complete the comprehensive requirement prior to graduation.

Course Requirements

Lower-Division Courses

Lower-division preparation:

Students must take the following three courses or their articulated equivalents.

SOCY 30A	Introduction to Global Information and Social Enterprise Studies	5
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And select two from the following three options:

SOCY 1	Introduction to Sociology	5
SOCY 10	Issues and Problems in American Society	5
SOCY 15	World Society	5

Lower-division core courses:

The following two sociology courses, or their articulated equivalents, are required as the foundation of statistical and research methods in the discipline.

SOCY 3A	The Evaluation of Evidence	5
SOCY 3B	Statistical Methods	5

Upper-Division Courses

Upper-division GISES core courses

The following two courses are required for the design and implementation of the GISES project.

SOCY 107A	Designing ICT Projects for Social Enterprise	5
SOCY 107B	Project Implementation and Grant Writing for Social Entrepreneurs	3

Upper-division core courses

The following two sociology courses are required as the foundation of theoretical training in the discipline.

SOCY 105A	Classical Social Theory	5
SOCY 105B	Contemporary Social Theory	5

Upper-division advanced coursework

Five upper-division electives are required, selected from the Sociology Department elective courses, Sociology 110-189, or from the list of approved courses (p. 721). Students are strongly recommended to consult with the director of GISES before choosing their electives, to ensure that their choices contribute to their selected project and/or their growth as a technology activist or technology linked social change advocate. Courses outside the list of approved courses may also be approved by the director of GISES. For more information on the process students must follow to have their courses

approved, please visit the Sociology Department webpage.

Project practicum

Students must enroll in SOCY 196G, Project Practicum, and complete their GISES capstone project. SOCY 196G is offered every fall quarter. Students may review the GISES webpage, or contact the program director of GISES (socy@ucsc.edu) for more detailed guidelines regarding the GISES capstone project. Prior to enrolling in SOCY 196G, students are required to submit, electronically, a one-page polished and concise summary of the GISES capstone project that will be the focus of their project practicum. This project summary constitutes a prerequisite for enrolling in SOCY 196G.

SOCY 196G	Project Practicum: Global Information and Social Enterprise	5
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Electives

Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The goal of the Sociology Department's Disciplinary Communication requirement is to ensure that students acquire and develop the skills in writing and other forms of communication that will best serve them in their study of sociology, and as future learners. The following courses satisfy the Disciplinary Communication requirement for students in programs administered by the Sociology Department.

SOCY 105A	Classical Social Theory	5
SOCY 105B	Contemporary Social Theory	5

Comprehensive Requirement

Prior to graduation, students are required to complete one of the following comprehensive requirements.

Senior Seminar

SOCY 196S	Senior Seminar	5
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Sociology Graduate Course

Students may satisfy the comprehensive requirement by successfully completing a graduate-level sociology course, numbered SOCY 201- SOCY 294. Enrollment into a graduate-level sociology course is by invitation or approval of the course instructor.

Senior thesis

SOCY 195A	Senior Thesis	5
SOCY 195B	Senior Thesis	5
SOCY 195C	Senior Thesis	5

Planners

Sociology with Concentration in GISES Intensive Major Planner One

The following is a recommended academic plan for students in the sociology with concentration in GISES intensive major.

Option One

Year	Fall	Winter	Spring
1st (frosh)	SOCY 1	SOCY 10	
2nd (soph)	SOCY 3A SOCY 30A	SOCY 3B SOCY 107A	SOCY 107B
3rd (junior)	SOCY 105A SOCY 196G	SOCY 105B Upper-division elective	Upper-division elective Upper-division elective
4th (senior)	Upper-division elective	Upper-division elective	SOCY 196S or SOCY Graduate Course (or in fall or winter) (or thesis fall-winter-spring)

4th (senior)	SOCY 105A	SOCY 105B	SOCY 196S or SOCY Graduate Course (or in fall or winter) (or thesis fall-winter-spring)
	SOCY 196G	Upper-division elective	Upper-division elective

All students majoring in sociology with concentration in GISES are required to take SOCY 3B which also satisfies the SR general education (GE) requirement, as well as SOCY 30A which satisfies the PE-H GE. SOCY 15, which satisfies the CC GE, may be selected as one of the major qualification course options. In addition, students may satisfy the CC, ER, and TA GEs by selecting certain upper-division sociology electives. Visit the Office of the Registrar's website for an up-to-date list of the sociology upper-division electives that satisfy general education requirements. The IM, MF, SI, PR and composition GE requirements are not offered through the Sociology Department.

Sociology with Concentration in GISES Intensive Major Planner Two

The following is a recommended academic plan for transfer students entering the sociology with concentration in GISES intensive major. It is assumed that SOCY 1 and SOCY 10 equivalencies were completed at the previous college.

Option Two

Year	Fall	Winter	Spring
1st (frosh)			SOCY 1
2nd (soph)	SOCY 15 SOCY 3A	SOCY 3B	
3rd (junior)	SOCY 30A Upper-division elective	SOCY 107A Upper-division elective	SOCY 107B Upper-division elective

Year	Fall	Winter	Spring
1st (junior)	SOCY 3A*	SOCY 3B*	SOCY 107B
	SOCY 30A	SOCY 107A	SOCY 105B
	Upper-division elective	SOCY 105A	
2nd (senior)	Upper-division elective	Upper-division elective	SOCY 196S or SOCY Graduate Course (or in fall or winter) (or thesis fall-winter-spring)
	SOCY 196G	Upper-division elective	Upper-division elective

*Articulated equivalent courses may be taken prior to transfer

This planner also assumes that a student has completed most of the general education requirements, beyond major preparation requirements, before transferring to UC Santa Cruz.

GISES MINOR

Students must take one course prior to petitioning for entry to the GISES minor: SOCY 30A, Introduction to Global Information and Social Enterprise Studies. In order to declare the GISES minor, students must first have declared a major and must also connect with the sociology undergraduate advisor to review and complete the declaration process. For details, please review the Sociology Department webpage.

Course Requirements

Students minoring in GISES are required to complete the following courses and requirements:

Lower-Division Courses

Lower-division preparation:

SOCY 30A	Introduction to Global Information and Social Enterprise Studies	5
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Upper-Division Courses

Upper-division GISES core courses:

SOCY 107A	Designing ICT Projects for Social Enterprise	5
SOCY 107B	Project Implementation and Grant Writing for Social Entrepreneurs	3

Upper-division advanced coursework:

Three additional upper-division electives are required, selected from the Sociology Department elective courses, Sociology 110-189, or from the list of approved courses (p. 721). Students are strongly recommended to consult with the director of GISES before choosing their electives, to ensure that their choices contribute to their selected project and/or their growth as a technology activist or technology linked social change advocate. Courses outside the list of approved courses may also be approved by the director of GISES. For more information on the process students must follow to have their courses approved, please visit the Sociology Department page.

Project practicum:

Students must enroll in SOCY 196G, Project Practicum and complete their GISES capstone project. Students may review the GISES webpage, or contact the program director of GISES (socy@ucsc.edu) for more detailed guidelines regarding the GISES capstone project. Prior to

enrolling in SOCY 196G, students are required to submit electronically a one-page polished and concise summary of the GISES capstone project that will be the focus of their project practicum. This project summary constitutes a prerequisite for enrolling in SOCY 196G.

The final GISES capstone project must make an unambiguous contribution to advancing a solution to a problem associated with global social justice and/or sustainable development. The project must be associated with a real, viable civil society organization, community organization, school or non-governmental organization (NGO). To complete the final requirements for a GISES major or minor, the integrated project—narrative and digital deliverable—must be mounted on the appropriate web-enabled database managed by the Everett Program.

SOCIOLOGY PH.D.

Introduction

The Sociology Department at UCSC is intellectually innovative, both in its interdisciplinary emphasis and in its commitment to inquiry that is engaged with the world beyond the university. The Ph.D. program is designed to educate students in sociological theory and methods and in the discipline's major substantive areas while simultaneously exposing students to other arenas of intellectual inquiry that will aid them as they pursue their research questions and interests. After completing a group of required courses, students work closely with individual faculty members in designing their course of study. The program leads to a doctor of philosophy (Ph.D.) degree in sociology and prepares students for both academic and non-academic careers. The department does not offer a terminal master of arts (M.A.) program. However, students have the option of applying for a non-terminal master's degree en route to the Ph.D.

Features of the Program

The core curriculum is divided into two parts, 1) basic grounding in sociological theory and methods, and 2) exposure to research in three areas of concentration: a) political economies and political ecologies; b) new studies of inequality; and c) culture, knowledge, and power. To prepare students to conduct their own research projects, the department trains students in multiple methods—field research, critical ethnography, cultural analysis, comparative historical analysis, and quantitative data analysis. For an overview of the faculty members' research interests, please refer to the program description.

Graduate students are supported through teaching assistantships, teaching fellowships, research fellowships and other grant/fellowship opportunities. A number of faculty receive research grants that support graduate student research assistantships.

When asked what they most appreciate about the sociology graduate program, most students cite the students' and faculty's commitment to social change in combination with their dedication to teaching, scholarly research, and understanding of the social forces of our

society. The Sociology Department's colloquium series enhances scholarship, practice, and collegial networks. The diversity in age, ethnicity, and work experience of the student body creates a vibrant atmosphere for learning.

Many of the faculty in the Sociology Department have affiliations with other departments and programs on campus, and the graduate program consequently encourages interdisciplinary work. Seminars in the anthropology, environmental studies, history, history of consciousness, politics, psychology, and feminist studies programs are open to sociology students. Graduate students in sociology may obtain a designated emphasis on the sociology Ph.D. diploma which indicates that in addition to sociology, they have also specialized in another field, such as feminist studies, Latin American and Latino studies, critical race and ethnic studies, environmental studies, philosophy, or education. Students must meet requirements for the designated emphasis as spelled out by the relevant department. For a complete list of programs that offer a designated emphasis, refer to the fields of study in the General Catalog. Students also participate in research projects under the auspices of a number of interdisciplinary social science research centers: the Science and Justice Research Center; the Center for Agroecology and Sustainable Food Systems; the Center for Labor Studies; the Research Center for the Americas; and the Affect Studies Working Group. Research opportunities also are available in the areas of environmental studies, feminist studies, and lesbian/gay/queer studies.

Many of our graduate students present papers at professional conferences and publish articles during the course of their graduate studies. The sociology master's paper is designed to prepare students to write for professional journals. Advanced graduate students also participate in faculty seminars organized around specific research topics.

The sociology program provides graduate students with many teaching opportunities so they can practice the skills required for good teaching—the ability to articulate ideas, to organize and present materials in logical sequence, and to listen attentively and discern someone else's comprehension. Graduate students typically serve as teaching assistants for at least three quarters, if not more, in the department's core classes of the undergraduate curriculum.

Details of the policies for admission to the graduate program, the requirements for the Ph.D. degree, and information on financial support opportunities are available from the Department of Sociology. For more information, please refer to the Graduate Studies section of the catalog.

Advancement to Candidacy

Course Requirements

Students are required to take at least 10 courses as follows.

A three-course core group:

SOCY 201	The Making of Classical Theory	5
SOCY 202	Contemporary Sociological Theory	5
SOCY 203	Sociological Methods	5

Two methods courses:

This course

SOCY 204	Methods of Quantitative Analysis	5
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And one of the following eight courses:

SOCY 205	Field Research Methods	5
SOCY 206	Comparative Historical Methods	5
SOCY 209	The Analysis of Cultural Forms	5
SOCY 241	Cross-National and Cross-Cultural Research	5
SOCY 242	Feminist Research Seminar	5
SOCY 268A	Science and Justice: Experiments in Collaboration	5
SOCY 282	Social Policy Research	5
PSYC 248	Survey Methods	5

Two of three thematic area courses:

SOCY 220	Global Transformation: Macrosociological Perspectives	5
SOCY 240	Inequality and Identity	5
SOCY 260	Culture, Knowledge, Power	5

A minimum of three elective graduate seminars, one of which may be from outside sociology (excluding SOCY 250 and SOCY 293).

SOCY 204: Students with no background in statistics are strongly advised to take an undergraduate course in statistical methods before enrolling in Methods of Quantitative Analysis, but can be admitted with permission of the instructor.

Elective Courses

A minimum of three elective graduate seminars, one of which may be from outside sociology (excluding SOCY 250 and SOCY 293). The elective course offerings change yearly. This selection of courses are offerings from the recent past.

SOCY 208	Writing Practicum	5
SOCY 209	The Analysis of Cultural Forms	5
SOCY 220	Global Transformation: Macrosociological Perspectives	5
SOCY 223	Sociology of the Environment	5
SOCY 225	Political Economy for Sociologists	5
SOCY 229	Work and Labor Markets in the New Economy	5

SOCY 240	Inequality and Identity	5
SOCY 242	Feminist Research Seminar	5
SOCY 244	Race and Ethnicity	5
SOCY 246	Class, Culture, and Movement	5
SOCY 249	Feminisms and Cultural Politics	5
SOCY 255	Engaging Cultural Studies	5
SOCY 256	Urban Sociology	5
SOCY 257	Colonialism, International Law, and Global Justice	5
SOCY 259	Space and the Politics of Difference	5
SOCY 260	Culture, Knowledge, Power	5
SOCY 263	Cultural Politics of Difference	5
SOCY 268A	Science and Justice: Experiments in Collaboration	5
SOCY 268B	Science and Justice Research Seminar	5
SOCY 290	Advanced Topics in Sociological Analysis	5

SOCY 209 SOCY 268A: Can be taken as an elective if not fulfilling the methods requirement.

Students are required to take two of the three thematic area courses—SOCY 220, SOCY 240, SOCY 260—and the third may count as an elective.

Foreign Language Requirements

Teaching Requirement

Pre-Qualifying Requirements

Graduate students initiate work on their master's paper by the end of the first year.

Completion of the master's paper and required coursework is expected by the end of the second year.

Graduate students prepare field statements in two distinct areas of sociology as a written pre-qualifying stage to the oral qualifying examination.

Qualifying Examination

The qualifying examination is an oral defense of the student's dissertation proposal and occurs one quarter after the pre-qualifying field statement stage has been passed.

Students are expected to take their oral qualifying examination by the end of the third year, but no later than the end of the fourth year.

Post-Qualifying Requirements

[Optional Catchall]

Dissertation

Dissertation

After passing the qualifying examination, a student advances to candidacy and begins work on the dissertation under the guidance of a three-person dissertation committee.

Dissertation Defense

After the complete dissertation has been submitted to and accepted by the dissertation committee, students must pass an oral dissertation defense.

Academic Progress

Applying for Graduation

[Optional Catchall]

SOCIOLOGY DESIGNATED EMPHASIS

Introduction

Graduate students interested in pursuing the Designated Emphasis in Sociology should contact the Sociology graduate program coordinator.

Requirements

To receive the Designated Emphasis (DE) in Sociology, a graduate student from another department must complete the following requirements in addition to the degree requirements for the doctorate in their degree-granting department. Students must initiate the request for the DE through their home departments. Then the student must meet with the Sociology graduate director who will: a) decide whether to approve the application; b) help find a Sociology faculty advisor; and c) oversee progress in the Designated Emphasis.

Committee Composition and Departmental Approvals

Advisor: In addition to the student's advisor(s) in their home department, the student must have a faculty advisor from among the core faculty of the Sociology Department who commits to serve on the qualifying examination (QE) committee. Outside members of a QE committee must be tenured.

Course Requirements

The student must take five (5) Sociology graduate seminar courses:

Two (2) core courses:

SOCY 201	The Making of Classical Theory	5
SOCY 202	Contemporary Sociological Theory	5

One (1) methods course from the following:

SOCY 203	Sociological Methods	5
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SOCY 204	Methods of Quantitative Analysis	5
SOCY 205	Field Research Methods	5
SOCY 206	Comparative Historical Methods	5
SOCY 209	The Analysis of Cultural Forms	5
SOCY 241	Cross-National and Cross-Cultural Research	5
SOCY 242	Feminist Research Seminar	5
SOCY 282	Social Policy Research	5

Two (2) other graduate seminar electives offered by the Sociology Department

*SOCY 208, SOCY 250, SOCY 293, SOCY 297, SOCY 299 cannot be counted toward the requirements for the Designated Emphasis.

All courses must be offered by the Sociology Department. Courses offered by other departments do not count towards the requirements for the Designated Emphasis in Sociology.

Writing, Research and/or Teaching Requirements

The student must prepare a significant piece of scholarly writing in the area of sociology. This may take the form of a substantial seminar paper, a master's essay, a paper submitted for publication, or a chapter of the doctoral dissertation. The student's Sociology faculty advisor will determine whether a particular piece of writing meets the requirement.

Academic Progress

[Optional Catchall]

SOCIOLOGY COURSE LIST

Course Lists for Sociology BA GISES Intensive Major and GISES Minor

Anthropology

ANTH 110A	Public Life and Contemporary Issues	5
ANTH 110E	Anthropology of Global Environmental Change	5
ANTH 110Q	Queer Sexuality in Black Popular Culture	5
ANTH 110Y	Feeding California	5
ANTH 129	Beyond Borders: Other Globalizations and Histories of Interconnection	5
ANTH 130A	Anthropology of Africa.	5
ANTH 130B	Brazil	5
ANTH 130C	Politics and Culture in China	5

ANTH 130E	Culture and Politics of Island Southeast Asia	5
ANTH 130F	Blackness In Motion: Anthology of the African Diasporas	5
ANTH 130G	Asian Americans in Ethnography and Film	5
ANTH 130H	Ethnography of Russia and Eastern Europe	5
ANTH 130I	Cultures of India	5
ANTH 130J	Politics and Statemaking in Latin America	5
ANTH 130L	Ethnographies of Latin America	5
ANTH 130M	Inside Mexico	5
ANTH 130N	Native Peoples of North America	5
ANTH 130O	Native Feminisms, Gender, and Settler Colonialism	5
ANTH 130P	Ethnography of Southern Cone Chile and Argentina	5
ANTH 130T	Religion and Politics in the Muslim World	5
ANTH 130U	Central America	5
ANTH 130V	Ethnography of Russia	5
ANTH 130W	Ethnography of Eastern Europe	5
ANTH 130X	Special Topics in Ethnography	5
ANTH 131	Gender in Cross-Cultural Context	5
ANTH 138	Political Anthropology	5
ANTH 142	Anthropology of Law	5
ANTH 144	Anthropology of Poverty and Welfare	5
ANTH 146	Anthropology and the Environment	5
ANTH 148	Gender and Global Development	5
ANTH 158	Feminist Ethnographies	5
ANTH 159	Race and Anthropology	5

Art

ART 101	Introduction to Computer Programming for the Arts	5
ART 181	Art, Power & Politics	5

College Ten

CLTE 191	Teaching Social Justice	5
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Community Studies

CMMU 101	Communities, Social Movements, and the Third Sector	5
CMMU 132	American Cities and Social Change	5
CMMU 133	Making California: Landscapes, People, Politics, Economy	5
CMMU 134	No Place Like Home	5

CMMU 141	Political Justice in Theory and Practice	5	ECON 138	The Economics and Management of Technology and Innovation	5
CMMU 145	Global Capitalism: a History of the Present	5	ECON 139A	The Economics of Electronic Commerce	5
CMMU 149	Political Economy of Food and Agriculture	5	ECON 139B	E-Commerce Strategy	5
CMMU 160	Public Health	5	ECON 141	International Finance	5
CMMU 161	Gender Health and Justice	5	ECON 142	Advanced Topics in International Economics	5
CMMU 163	Health Care Inequalities	5	ECON 143	Policy Issues in the International Economy	5
CMMU 186	Food and Agriculture Social Movements	5	ECON 148	Latin American Economies	5
CMMU 189	Methods of Teaching Community Studies	5	ECON 149	The Economies of East and Southeast Asia	5
CMMU 193	Field Study	5	ECON 156	Health Care and Medical Economics	5
Computational Media			ECON 159	The Economics of Organizations	5
CMPM 131	User Experience for Interactive Media	5	ECON 160A	Industrial Organization	5
Computer Science and Engineering			ECON 160B	Government and Industry	5
CSE 101	Introduction to Data Structures and Algorithms	5	ECON 161A	Marketing	5
CSE 118	Mobile Applications	5	ECON 162	Legal Environment of Business	5
CSE 171A	Introduction to Management of Technology I	5	ECON 169	Economic Analysis of the Law	5
CSE 171B	Introduction to Management of Technology II	5	ECON 170	Environmental Economics	5
CSE 173	Financial Engineering and Management in High Technology Firms	5	ECON 171	Natural Resource Economics	5
CSE 174	Decision Analysis in Management	5	ECON 175	Energy Economics	5
CSE 175	Business Strategy and Information Systems	5	ECON 180	Labor Economics	5
			ECON 183	Women in the Economy	5
Critical Race and Ethnic Studies			Education		
CRES 100	Comparative Theories of Race and Ethnicity	5	EDUC 102	Education, Media, and Society	5
CRES 101	Research Methods and Writing in Critical Race and Ethnic Studies	5	EDUC 104	Ethical Issues and Teaching	5
CRES 185A	Race, Gender, and Science	5	EDUC 128	Immigrants and Education	5
Economics			EDUC 135	Gender and Education	5
ECON 101	Managerial Economics	5	EDUC 140	Language, Diversity, and Learning	5
ECON 104	Is There Truth in Numbers: The Role of Statistics in Economics	5	EDUC 141	Bilingualism and Schooling	5
ECON 115	Introduction to Management Sciences	5	EDUC 160	Issues in Educational Reform	5
ECON 120	Development Economics	5	EDUC 164	Urban Education	5
ECON 121	Economic Growth	5	EDUC 166	Technology and Education	5
ECON 126	Why Economies Succeed or Fail: Lessons from Western and Japanese History	5	EDUC 170	East Asian Schooling and Immigration	5
ECON 128	Poverty and Public Policy	5	EDUC 171	South and Southeast Asian Schooling and Immigration	5
ECON 131	International Financial Markets	5	EDUC 173	Seminar in Critical Pedagogy	5
ECON 136	Business Strategy	5	EDUC 174	Ethnographic Research in Schools and Communities	5
			EDUC 177	Teaching Linguistically Diverse Students	5

EDUC 178	Advanced Educational Studies	5	ENVS 173	An Introduction to World Environmental History	5
EDUC 180	Introduction to Teaching	5	ENVS 176	Vulnerability, Complex Systems, and Disasters	5
EDUC 181	Race, Class, and Culture in Education	5	ENVS 177	Teaching Environmental Education	5
EDUC 182	American Teacher	5	ENVS 179	Environmental Interpretation	5
EDUC 187	Cognition and Instruction	5	ENVS 183	Environmental Studies Internship	5
EDUC 198	Independent Field Study	5	ENVS 192	Directed Student Teaching	5
Environmental Studies			ENVS 194	Teaching Environmental Studies	5
ENVS 104A	Introduction to Environmental Field Methods	5	Feminist Studies		
ENVS 110	Institutions, the Environment, and Economic Systems	5	FMST 102	Feminist Critical Race Studies	5
ENVS 115A	Geographic Information Systems and Environmental Applications	5	FMST 112	Women and the Law	5
ENVS 115B	Intermediate Geographic Information Systems (GIS)	5	FMST 115	Gender, Sexuality, and Transnational Migration Across the Americas	5
ENVS 115C	Advanced Geographic Information Systems	5	FMST 120	Transnational Feminisms	5
ENVS 130A	Agroecology and Sustainable Agriculture	5	FMST 123	Feminism and Cultural Production	5
ENVS 130B	Justice and Sustainability in Agriculture	5	FMST 124	Technology, Science, and Race Across the Americas	5
ENVS 130C	Field Experiences in Agroecology and Sustainable Food	5	FMST 125	Race, Sex, and Technology	5
ENVS 140	National Environmental Policy	5	FMST 126	Images, Power, and Politics: Methods in Visual and Textual Analysis	5
ENVS 141	Ecological Economics	5	FMST 131	The Politics of Matter and the Matter of Politics	5
ENVS 142	Sustainable Energy	5	FMST 132	Gender and Postcoloniality	5
ENVS 143	Sustainable Development: Economy, Policy, and Environment	5	FMST 133	Science and the Body	5
ENVS 145	Green Cities	5	FMST 135	Topics in Science and Sexuality	5
ENVS 146	Water Quality: Policy, Regulation, and Management	5	FMST 139	African American Women's History	5
ENVS 147	Environmental Inequality/Environmental Justice	5	FMST 175	Gender and Sexualities in Latina/o America	5
ENVS 149	Environmental Law and Policy	5	FMST 189	Advanced Topics in Feminist Theory	5
ENVS 150	Coastal and Marine Policy	5	Film and Digital Media		
ENVS 151	Environmental Assessment	5	FILM 136C	Visual Culture and Technology: History of New Media	5
ENVS 154	Amazonian Cultures and Conservation	5	FILM 136D	Documentary Film and Video	5
ENVS 156	Environmental Action Through Writing	5	FILM 170A	Fundamentals of Digital Media Production	5
ENVS 160	Restoration Ecology	5	FILM 172	Narrative Video Workshop	5
ENVS 165	Sustainable Water Systems	5	FILM 173	Narrative Digital Media Workshop	5
ENVS 166	Agroecosystem Analysis and Watershed Management	5	FILM 175	Documentary Video Workshop	5
ENVS 172	Environmental Risks and Public Policy	5	FILM 176	Experimental Video Workshop	5
			FILM 177	Digital Media Workshop: Computer as Medium	5

FILM 178A	Personal Computers in Film and Video	5	Jewish Studies		
FILM 178B	Advanced Personal Computers in Film and Video	5	JWST 185N	The Holocaust in a Digital World	5
FILM 189	Advanced Topics in Digital and Electronic Media Studies	5	Latin American and Latino Studies		
FILM 192	Directed Student Teaching	5	LALS 115	Mexico-United States Migration	5
FILM 194B	Electronic Media Theory Seminar	5	LALS 122	Media and Nationalism	5
FILM 199	Tutorial	5	LALS 128	Latino Media in the U.S	5
			LALS 129	America Latina: Cine, Dictadura y Memoria	5
			LALS 143J	Global Political Economy	5
			LALS 145	Grassroots Social Change in Latin America	5
History			LALS 150	Afro-Latinos/as: Social, Cultural, and Political Dimensions	5
HIS 105	Nations and Nationalism	5	LALS 152	Consumer Cultures Between the Americas	5
HIS 110A	Colonial America, 1500-1750	5	LALS 155	Latin American and Latino Youth Movements	5
HIS 110E	Rise of the Machines: Technology, Inequality, and the United States, 1877 to 1914	5	LALS 156	Human Rights and Transitional Justice in the Americas	5
HIS 111	Popular Conceptions of Race in U.S. History, 1600-Present	5	LALS 158	Latin American Political Economy	5
HIS 114	Market Revolution in Antebellum U.S.	5	LALS 168	Inter-American Relations	5
HIS 117	Wired Nation: Broadcasting & Telecommunications in the US from the Telegraph to the Internet	5	LALS 169	South America: History, Society, and Culture	5
HIS 145	Gender, Colonialism, and Third-World Feminisms	5	LALS 170	Indigenous Struggles in the Americas	5
HIS 166	Northern Ireland: Communities in Conflict	5	LALS 172	Visualizing Human Rights	5
HIS 185O	The Holocaust and the Arab World	5	LALS 178	Gender, Transnationalism, and Globalization	5
HIS 190K	Wired Planet: Readings on the Global History of Broadcasting and Telecommunications	5	LALS 180	Borders: Real and Imagined	5
HIS 190L	Personal Politics in the New South	5	Legal Studies		
			LGST 108	Gender, Sexuality, and Law	5
History of Art and Visual Culture			LGST 109	Legal Theory	5
HAVC 127F	The Politics of Exclusion: Asian American Visual Culture	5	LGST 111B	Civil Liberties	5
HAVC 141H	Media History and Theory	5	LGST 111C	Issues in Constitutional Law	5
HAVC 141K	Activist Art Since 1960: Art, Technology, Activism	5	LGST 113	Gay Rights and the Law	5
HAVC 143E	History of Design: The Objects of Technology, 1850-The Present	5	LGST 114	Jews, Anti-Semitism, and the American Legal System	5
			LGST 116	Comparative Law	5
History of Consciousness			LGST 125	History of the U.S. Penal Culture	5
HISC 112	Foundations in Critical Theory	5	LGST 130	Inequality and Law	5
HISC 117	Making the Refugee Century: Non-Citizens and Modernity	5	LGST 131	Wildlife, Wilderness, and the Law	5
HISC 150	Radical Political Theory	5	LGST 133	Law of Democracy	5
HISC 185T	Marxism and Feminism	5	LGST 135	Native Peoples Law	5
			LGST 136	Federal Indian Law and International Comparative Indigenous Peoples' Law	5
			LGST 137	International Environmental Law and Policy	5
			LGST 152	Courts and Litigation	5
			LGST 159	Property and the Law	5
			LGST 193	Field Study	5

Literature						
LIT 120H	American Poetry Since World War II	5	POLI 143	Comparative Post-Communist Politics	5	
LIT 138A	Culture and Nation	5	POLI 144	Andean Politics	5	
LIT 160F	Topics in Cultural Studies	5	POLI 146	The Politics of Africa	5	
LIT 160G	Topics in Literary Theory	5	POLI 148	Social Movements	5	
Oakes College			POLI 149	Democratic Transitions	5	
OAKS 153	Community Mapping	5	POLI 151	Politics of Law	5	
Philosophy			POLI 160A	Theories of International and World Politics	5	
PHIL 126	Philosophy of Social Sciences	5	POLI 160B	International Law	5	
PHIL 144	Topics in Social and Political Philosophy	5	POLI 160C	Security, Conflict, Violence, War	5	
Politics			POLI 160D	International Political Economy	5	
POLI 103	Feminist Interventions	5	POLI 161	The Rise of China	5	
POLI 105C	Modern Political Thought	5	POLI 163	U.S. Foreign Policy	5	
POLI 110	Law and Social Issues	5	POLI 165	Global Organization	5	
POLI 111A	Constitutional Law	5	POLI 166	Politics of Migration	5	
POLI 114	Thinking Green: Politics, Philosophies, and Practices of Sustainability	5	POLI 167	Politics of International Trade	5	
POLI 115	Foundations of Political Economy	5	POLI 168	Topics in International Relations and Global Politics	5	
POLI 117	Manufactured Truth and Narratives of Power	5	POLI 169	Politics of Development	5	
POLI 118	Critical Political Thought and Critical Theory	5	POLI 172	Liberalism, the State, and the War on Terror	5	
POLI 120A	Congress, President, and the Court in American Politics	5	POLI 174	Global Political Ecology	5	
POLI 120B	Society and Democracy in American Political Development	5	POLI 175	Human Rights	5	
POLI 120C	State and Capitalism in American Political Development	5	POLI 185	Political Psychology	5	
POLI 121	Race & Justice in America	5	Psychology			
POLI 122	Politics, Labor, and Markets	5	PSYC 108	Educational Psychology	5	
POLI 124	Economic Inequality in America	5	PSYC 119P	Children and Technology	5	
POLI 125	Political Organizations in American Politics	5	PSYC 119T	Media Contexts of Adolescent and Young Adult Development	5	
POLI 128	American Elections and Voting Behavior	5	PSYC 127	Computer Mediated Communication	5	
POLI 129	Policies and Politics of American Defense	5	PSYC 128	Human Factors	5	
POLI 132	California Water Law and Policy	5	PSYC 129	Human Learning and Memory	5	
POLI 134	Congress: Representation and Legislation	5	PSYC 132	Neural Modeling	5	
POLI 135	Immigration Policy and Debate in the U.S.	5	PSYC 138	Computer Programming for the Cognitive Sciences	5	
POLI 136	Applied Public Policy	5	PSYC 139D	Modeling Human Performance	5	
POLI 140A	European Politics	5	PSYC 140F	Mind, Society, and Culture	5	
POLI 140C	Latin American Politics	5	PSYC 140M	Legitimizing (In)Equality: Attitudes, Beliefs, and Social Policy	5	
POLI 140D	Politics of East Asia	5	PSYC 141	Privacy and Surveillance	5	
POLI 141	Politics of China	5	PSYC 142	Psychology of Oppression and Liberation	5	
POLI 142	Russian Politics	5	PSYC 144	Latinx Psychology	5	
			PSYC 145	Social Influence	5	
			PSYC 145D	Social Psychology of Autocracy and Democracy	5	
			PSYC 146	The Social Context	5	
			PSYC 147A	Psychology and Law	5	
			PSYC 147B	Psychology and Law	5	

PSYC 149	Community Psychology: Transforming Communities	5
PSYC 153	The Psychology of Poverty and Social Class	5
PSYC 155	Social-Community Psychology in Practice	5
PSYC 159H	Community-Based Interventions	5
PSYC 159R	Achievement Disparities: A Social Psychological Perspective	5
PSYC 159X	Psychology of Social Activism	5
PSYC 169	Community Mental Health (CMH)	5
PSYC 179G	Child, Youth, and Family Assistance in the Community	5
PSYC 192	Directed Student Teaching	5
Rachel Carson College		
CRSN 160	Developing Leadership to Facilitate Environmental Education	5
CRSN 161	Education for Sustainable Living Program	5
Stevenson College		
STEV 192	Directed Student Teaching	5

THE COLLEGES

College Nine

College Office
217 Social Sciences 1
(831) 459-5034
<https://collegenine.ucsc.edu>

ACADEMIC PROGRAMS

Academic Literacy Curriculum (p. **Error! Bookmark not defined.**)

College Scholars Program

ACADEMIC EMPHASIS

College Nine's theme of International and Global Perspectives emphasizes the causes and consequences of our increasingly interconnected world. We challenge students to grapple with complex, controversial, and multi-scalar issues, for which there exist vastly differing opinions about the nature of problems and how to solve them. Becoming a global citizen requires critical thinking, cultural awareness, and effective communication, all skills our training provides to our students. Our academic and co-curricular programs analyze economic and cultural globalization, immigration, environmental crises, ethnic conflicts, genocide, and human rights, among other issues. Students interested in these issues either as their major focus or as part of their general education are invited to join the College Nine community.

ORIENTATION

All new frosh and transfer students who start fall quarter are required to enroll in one of two online orientation courses. Frosh will enroll in CLNI 1A, College Nine 1A: Introduction to University Life and Learning. Transfer students will enroll in KRSG 1T, Kresge 1T: Introduction to Research Universities and the Liberal Arts. CLNI 1A and KRSG 1T integrate introductions to academic skills with the online Slug Orientation process, and begin student preparation for their studies at College Nine and throughout UC Santa Cruz.

CLNI 1A Introduction to University Life and Learning (1 credit)

Offered online in summer quarter

KRSG 1T Introduction to Research Universities and the Liberal Arts (1 credit)

Offered online in summer quarter

Students who are admitted to winter quarter will take an orientation course during their first term.

CORE COURSE

CLNI 1: Academic Literacy and Ethos: International and Global Perspectives

Offered in fall quarter

First-year students examine current issues pertinent to the college's intellectual theme. This course challenges students to address what it means to be a global citizen, in recognition of our growing interconnections and interdependencies, and the fact that certain intractable problems cannot be addressed without large-scale collective action. Topics address issues such as globalization, inequities in wealth and poverty across the world, human rights, climate change, and social movements. The seminar teaches foundational concepts for intellectual exploration and personal development within an academic community—analysis, critical thinking, metacognition, engagement with others across difference, and self-efficacy. The instructors work closely with each student throughout the quarter.

COLLEGE ADVISING

Contact information:

nineadvising@ucsc.edu
Phone: 831-459-5034
217 Social Sciences 1

Located on the second floor of Social Sciences 1, our team of dedicated, knowledgeable and caring advisers are here to guide students throughout their journey at UC Santa Cruz, from being admitted to the university through graduation. Our approach is collaborative and student-centered, assisting undergraduates with identifying and exploring their academic interests and capacities, and providing advice as to how to make the most of their time at UCSC. Our advisers answer questions about navigating the policies and life at UC Santa Cruz, course scheduling and selection, degree and general education requirements, qualifying for a major, educational support and opportunities, and much more. Close partnerships with units across campus mean that if we do not know the answer to a question, we usually know someone who does.

Students who wish to connect with advising should visit the College Nine Academic Advising website for open hours, drop-ins, and appointments.

OTHER ACADEMIC PROGRAMS

Optional programs are available to involve College Nine students in academic and co-curricular activities beyond the first-quarter course. They are designed to promote students' academic achievement and success by connecting them with faculty mentors and helping them pursue leadership experiences.

Global Action

Global Action, CLNI 85, is a peer facilitated course where students learn about current international and global issues through interactive exercises, small group discussions, and faculty presentations. Students will develop an “action plan” to raise awareness about one or more of these concerns and take practical steps to create positive change in the world. Projects in past years have partnered with organizations doing outstanding work in countries like Ecuador, India and Nepal. Students who have taken and excelled in CLNI 85 are eligible to teach the course in a future year, enrolling in CLNI 191: Teaching Global Action, where they gain the skills, techniques and tools to facilitate their own section. Mentoring by our experienced staff is vital to realizing the potential of such peer-to-peer learning.

Apprenticeship in Community Engaged Research

The Apprenticeship in Community Engaged Research (or (H)ACER) is a new program at College Nine and College Ten designed to teach students qualitative research methods with a focus on community-engaged and participatory methodologies. The objectives of our work encompass student enrichment, uplifting the work of our community partners, and conducting relevant, critical research to solve real-life challenges at the intersections of education, health, economics, immigration, nutrition, labor and the environment. The benefits for students of experiential learning in the community are multiple: abstract academic concepts become more tangible, students expand their web of social connection, and skills such as teamwork and problem solving are heightened. Students reach outside of their comfort zone, have their assumptions challenged, and meet remarkable local heroes.

(H)ACER offers a scaffolded progression of opportunities for students: students can begin by getting involved with Praxis, participating in Alternative Spring Break, or signing up for internships with community partners such as an after-school, garden-based educational program at Calabasas Elementary School in Watsonville. Praxis is a student club for community service in which College Nine and College Ten students undertake monthly volunteer opportunities throughout Santa Cruz County and neighboring communities. During campus meetings, Praxis participants engage in discussion, reading, and reflection to increase their awareness and knowledge about key issues.

Alternative Spring Break (ASB) in Watsonville centers on issues of food security, sovereignty, and justice. After getting to know each other at a retreat, discussing readings, and hearing from a panel of Watsonville leaders, ASB participants undertake five days of experiential learning with a variety of community partners (e.g., schools, artists, non-profits). After Spring Break, a final gathering is held for students to share their final projects.

These community learning opportunities for students then transition in our (H)ACER class series. The classes train students in research methodologies, support data collection and analysis with our community and university partners, and provide cutting-edge and methodologically rich research experiences for UCSC undergraduate students. These classes set students up to develop their own research projects that can then extend into senior theses and pathways to distinction in Colleges Nine and Ten.

Practical Activism: Tools for Local and Global Change

The annual Practical Activism Conference is a day-long, student-led event featuring keynote speakers, multiple workshops, tabling by on- and off-campus organizations, performances, and a variety of hands-on activism activities. Students gain valuable leadership and organizing skills through developing and planning this exceptional program, which involves collaboration among faculty, staff, and the local community. Visit Practical Activism for more information.

Community Garden Class

In cooperation with the work of the Community Garden Club, this course explores such topics as collaborative garden design, community gardening best practices, building regenerative social and ecological systems, sustainability, and food justice, while also offering hands-on experience in the Colleges Nine and Ten community garden.

Education Abroad

The UC Education Abroad Program places students at a university in another country for one or more quarters. Studying abroad can be a valuable way to expand one’s understanding of the world. Given the international focus at College Nine, students are encouraged (but not required) to develop a second language or to study abroad.

College Nine Pathways to Distinction

Another feature of College Nine is that qualified students may graduate with College Nine Distinction. This recognition is intended to serve as an incentive for students to pursue activities (research, course work, service, leadership, internships, etc.) that are especially apt to help them succeed in college and beyond related to the theme of international and global perspectives.

College Ten

College Office
217 Social Sciences 1
(831) 459-5034
<https://collegeten.ucsc.edu>

ACADEMIC PROGRAMS

Academic Literacy Curriculum (p. **Error! Bookmark not defined.**)

College Scholars Program

ACADEMIC EMPHASIS

College Ten's theme of Social Justice and Community addresses a range of social problems and their impacts on society. Understanding the contemporary United States, for instance, requires social and historical frameworks that address concepts like racialized and gendered social hierarchies, the construction of marginalization and difference, the impacts of class differences, and many manifestations of unequal power relationships. A flourishing society that progresses toward social and environmental justice depends on informed, critical, and empathetic people willing to make the efforts necessary to create social change. At College Ten, we strive toward the goals of analyzing, embodying, and implementing ideas that help our students become knowledgeable and critical social actors who recognize and practice the principle that all people possess equal intrinsic worth. Our academic and co-curricular programs consider the injustices that many people confront in their lives, and possible policies for overcoming social, political, and economic inequalities. In addition, the college provides students with opportunities to make their own positive contributions to social change through community involvement and/or scholarly research.

ORIENTATION

All new frosh and transfer students who start fall quarter are required to enroll in one of two online orientation courses. Frosh will enroll in CLTE 1A, College Ten 1A: Introduction to University Life and Learning. Transfer students will enroll in KRSG 1T, Kresge 1T: Introduction to Research Universities and the Liberal Arts. CLTE 1A and KRSG 1T integrate introductions to academic skills with the online Slug Orientation process, and begin student preparation for their studies at College Ten and throughout UC Santa Cruz.

CLTE 1A Introduction to University Life and Learning (1 credit)

Offered online in summer quarter

KRSG 1T Introduction to Research Universities and the Liberal Arts (1 credit)

Offered online in summer quarter

Students who are admitted to winter quarter will take an orientation course during their first term.

CORE COURSE

CLTE 1: Academic Literacy and Ethos: Social Justice and Community

Offered in fall quarter

First-year students examine current issues pertinent to the college's intellectual theme. The core curriculum explores the causes and consequences of social injustice in several ways. Students examine the roots of prejudice, discrimination, and violence directed toward groups based on their ethnicity, skin color, gender, sexual orientation, religious practices, or political views. They also consider the causes and consequences of economic inequality both within the United States and around the world. In addition to articulation with the college theme, the core seminar teaches foundational concepts for intellectual exploration and personal development within an academic community—analysis, critical thinking, metacognition, engagement with others across difference, and self-efficacy. The instructors work closely with each student throughout the quarter.

COLLEGE ADVISING

Contact information:

tenadvising@ucsc.edu

Phone: 831-459-5034

Social Sciences 1, Room 217

Located on the second floor of Social Sciences 1, our team of dedicated, knowledgeable and caring advisors is here to guide students throughout their journey at UC Santa Cruz, from admission to the university through graduation. Our approach is collaborative and student-centered, assisting undergraduates with identifying and exploring their academic interests and capacities, and providing advice as to how to make the most of their time at UCSC. Our advisors answer questions about navigating the policies and life at UC Santa Cruz, course scheduling and selection, degree and general education requirements, qualifying for a major, educational support and opportunities, and much more. Close partnerships with units across campus mean that if we do not know the answer to a question, we usually know someone who does.

Students who wish to connect with Advising should visit the College Ten Academic Advising website for open hours, drop-ins, and appointments.

OTHER ACADEMIC PROGRAMS

Optional programs are available to involve College Ten students in academic and co-curricular activities beyond the first-quarter core course. They are designed to promote students' academic achievement and success by connecting them with faculty mentors and helping

them pursue leadership experiences and experiential learning opportunities.

Social Justice Issues Workshop

Social Justice Issues Workshop is a two-credit course, taught by student facilitators that meets once per week and can be taken in addition to a regular 15-credit academic load. The workshop offers a small, dynamic learning community in which members explore important issues of personal and cultural identity; social, political, and environmental concerns; and community-mindedness. The class emphasizes small-group experiential learning through structured exercises and group activities, and also includes discussions, film presentations, and guest speakers. Mentoring by our experienced staff is vital to realizing the potential of such peer-to-peer learning.

Apprenticeship in Community Engaged Research

The Apprenticeship in Community Engaged Research (or (H)ACER) is a new program at College Nine and College Ten designed to teach students qualitative research methods with a focus on community-engaged and participatory methodologies. The objectives of our work encompass student enrichment, uplifting the work of our community partners, and conducting relevant, critical research to solve real-life challenges at the intersections of education, health, economics, immigration, nutrition, labor and the environment. The benefits for students of experiential learning in the community are multiple: abstract academic concepts become more tangible, students expand their web of social connection, and skills such as teamwork and problem solving are heightened. Students reach outside of their comfort zone, have their assumptions challenged, and meet remarkable local heroes.

(H)ACER offers a scaffolded progression of opportunities for students: students can begin by getting involved with Praxis, participating in Alternative Spring Break, or signing up for internships with community partners such as an after-school, garden-based educational program at Calabasas Elementary School in Watsonville. Praxis is a student club for community service in which College Nine and College Ten students undertake monthly volunteer opportunities throughout Santa Cruz County and neighboring communities. During campus meetings, Praxis participants engage in discussion, reading, and reflection to increase their awareness and knowledge about key issues.

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Practical Activism: Tools for Local and Global Change

The annual Practical Activism Conference is a day-long, student-led event featuring keynote speakers, multiple workshops, tabling by on-and off-campus organizations, performances, and a variety of hands-on activism activities. Students gain valuable leadership and organizing skills through developing and planning this exceptional program, which involves collaboration among faculty, staff, and the local community. Visit Practical Activism for more information.

Community Garden Class

In cooperation with the work of the Community Garden Club, this course explores such topics as collaborative garden design, community gardening best practices, building regenerative social and ecological systems, sustainability, and food justice, while also offering hands-on experience in the Colleges Nine and Ten community garden.

College Ten Pathways to Distinction

Students are recognized with College Ten Distinction upon successful completion of three quarters (approximately 15 credits) of research experiences, coursework, service and leadership and/or writing intensive courses focused on social justice and community themes. Applicable College Ten courses, service opportunities and research opportunities with faculty can fulfill the criteria for distinction. This recognition is intended to serve as an incentive for students to pursue activities that help them succeed in college and beyond related to the theme of social justice and community.

Cowell College

Cowell 118
831-459-2253
<https://cowell.ucsc.edu>

ACADEMIC PROGRAMS

Academic Literacy Curriculum (p. **Error! Bookmark not defined.**)

College Scholars Program (p. 746)

ACADEMIC EMPHASIS

The academic theme of the college encourages students to pursue their general and disciplinary study with attention to the values of a liberal arts education: understanding one's individual perspectives by the exploration of one's historical background and world context. Students affiliated with the college pursue majors from all departments on campus.

In satisfying their general education requirements, first-year Cowell students are required to take the Cowell

core course in the fall term. The core course is taught in small seminar sections and seeks to develop critical reading, analytical writing, and seminar discussion skills through engagement with a selection of classic and contemporary texts focused on the theme of justice.

Enrichment courses are offered every term at the college, and priority is given to Cowell students. Some courses emphasize the development of skills such as public speaking or researching in library collections. Some courses take a broader perspective, examining the role of education in democracy or the epistemological bases of our judicial system.

The college also enriches the intellectual and cultural life of the campus by sponsoring events of various kinds: lectures and presentations by local faculty and visiting scholars, theatrical and musical performances, and forums and debates on topics of current interest.

Students who develop ideas for research, creative projects, community service, or internship experiences may apply to the college provost for financial support. The college also awards several annual scholarships and sponsors prizes for outstanding academic work.

The faculty fellows affiliated with the college represent all academic divisions (arts, engineering, humanities, physical and biological sciences, and social sciences). The faculty fellows guide the college academic programs and often contribute to the college-based advising system.

The college academic buildings house humanities faculty, with notable concentrations in philosophy, classics (study of ancient Greek and Latin language and civilization), and modern foreign languages, especially Chinese, French, Italian, Russian, German, and Japanese. Interdisciplinary faculty groups in visual and performance studies and in pre- and early-modern studies are centered at Cowell College.

ORIENTATION

All new frosh and transfer students who start fall quarter are required to enroll in one of two online orientation courses. Frosh will enroll in COWL 1A, Cowell 1A: Introduction to University Life and Learning. Transfer students will enroll in KRSG 1T, Kresge 1T: Introduction to Research Universities and the Liberal Arts. Cowell 1A and Kresge 1T integrate introductions to academic skills with the online Slug Orientation process, and begin student preparation for their studies at Cowell College and throughout UC Santa Cruz.

COWL 1A Introduction to University Life and Learning (1 credit)

Offered online in summer quarter

KRSG 1T Introduction to Research Universities and the Liberal Arts (1 credit)

Offered online in summer quarter

Students who are admitted to winter quarter will take an orientation course during their first term.

Core Course

COWL 1, Academic Literacy and Ethos: Imagining Justice

Offered fall quarter

Cowell College One, Imagining Justice, is a first-year analytical reading and critical thinking seminar required of all first-year students, offered only in the fall quarter. It provides intensive practice in critical thinking and analysis, while also giving students opportunities to increase their speaking and presentation skills, and to engage in creative expression. More broadly, it introduces students to university-level discourse including key skills and common practices, and UC Santa Cruz's academic expectations. It works to build an intellectual community here at Cowell College not only within the incoming class, but across all students at Cowell, since some texts are held over from year to year, so that students from frosh to seniors have reading and ideas in common.

COLLEGE ADVISING

Contact information:

cowell@ucsc.edu

831-459-2253

Cowell College Administration Building, Room 118

Cowell College advisors help students interpret academic policies and procedures and clarify educational goals. They provide support to students to ensure their academic success and progress toward their degree throughout their time at UC Santa Cruz. Advisors help students make informed decisions, develop resiliency, and develop the ability to take ownership of their academic choices. Advisors also connect students to resources that will enrich their academic experiences.

OTHER ACADEMIC PROGRAMS

College Scholars Program

Along with several other residential colleges, Cowell participates in the College Scholars Program, a program that engages first- and second-year students with faculty research in research seminars and service learning opportunities on campus and in the Santa Cruz community. Some students begin by invitation in the fall. Others apply to start in the spring. In the spring of their first year, the spring-start scholars join the fall-start scholars in a special two-credit class together, which includes special lectures and dinners. The program continues with selected seminars in the second year.

Cowell hosts several campuswide programs including the Chancellor's Undergraduate Internship Program

(CUIP), Model United Nations, Mock Trial, the Smith Society, the Center for Public Philosophy, and the Experiential Leadership Program.

Cowell supports student research through quarterly research awards and through a variety of scholarships and service awards.

Crown College

Crown College Administration Building
831-459-2412
<https://crown.ucsc.edu>

ACADEMIC PROGRAMS

Academic Literacy Curriculum (p. **Error! Bookmark not defined.**)

College Scholars Program (p. 746)

CROWN COLLEGE

Crown College seeks to provide our students with a living and learning environment in which they can positively develop intellectually and socially. Crown is traditionally viewed as the “science college,” and it does have a strong presence of engineering, biology and other STEM (Science, Technology, Engineering, and Math) students but lots of students majoring in the social sciences and some arts and humanities students call Crown home as well.

Crown is located on a hilltop surrounded by a redwood forest. The award-winning architecture with its white walls and high-pitched tiled roofs suggests a hillside Mediterranean village. The college’s residential facilities house approximately 800 students. The facilities at Crown College were built through a partnership of public funds and a gift from the Crown Zellerbach Foundation.

We enjoy the strong support of generations of Crownies that have maintained alive the connection they formed when they were students here. Alumni participate in advisory capacity in the college’s governance and their generous contributions have allowed Crown to renovate both Crown’s Library and its Fireside Lounge; enrich our Core experience, and expand our curriculum.

For more information on the Crown’s academic and social environment please visit Crown’s website and also see this feature article: Crown College: Science Minded, Socially Mindful.

ACADEMIC EMPHASES

From the time of its founding in 1967, issues pertaining to the role of science and technology in society have been a focus of special interest at Crown College. We approach these issues from an interdisciplinary perspective that recognizes the influence of social and cultural factors on the scientific enterprise, as well as

the ways in which science and technology influence our society.

ORIENTATION

All new frosh and transfer students who start fall quarter are required to enroll in one of two online orientation courses. Frosh will enroll in CRWN 1A, Crown 1A: Introduction to University Life and Learning. Transfer students will enroll in KRSRG 1T, Kresge 1T: Introduction to Research Universities and the Liberal Arts. Crown 1A and Kresge 1T integrate introductions to academic skills with the online Slug Orientation process, and begin student preparation for their studies at Crown and throughout UC Santa Cruz.

CRWN 1A Introduction to University Life and Learning (1 credit)

Offered online in summer quarter

KRSRG 1T Introduction to Research Universities and the Liberal Arts (1 credit)

Offered online in summer quarter

Students who are admitted to winter quarter will take an orientation course during their first term.

Core Course

CRWN 1, Academic Literacy and Ethos: Ethical and Societal Implications of Emerging Technologies

Offered fall quarter

Crown College’s entering frosh enroll in our core course, CRWN 1, which explores the theme, Ethical and Societal Implications of Emerging Technologies. Students work individually, in small groups of four to five students, and in sections of 25 to 30 students, thereby modeling and embracing the diversity found across campus. CRWN 1 looks at the current technological revolution and its implications both locally and globally. CRWN 1 also explores the ethical dilemmas involved and what we can do as responsible citizens to address the challenges facing our society. Deeper goals of this course include fostering a sense of belonging, and ensuring that our students develop the analytical reading, critical thinking, and effective communication skills that they need to succeed in their studies.

A central component of the course is a group research project, in which students study the impact of a technology of their choice, while learning strategies for effective group work. The core course is enhanced through our plenary series, which gives students opportunities to meet intellectual leaders and hear them speak, and through focus groups, where they have the opportunity to engage in discussion with all our faculty. We also organize a science-fiction short story contest, and students are encouraged to attend and/or present at Crown’s Social Fiction Conference. In winter of their frosh year, our students also have other opportunities to build on their Core experience by performing a play

connected to the theme of Core or by turning their research project into a podcast.

OTHER ACADEMIC PROGRAMS

Complementing its focus on science and technology, Crown supports the development of transferable skills and experiential learning through funding for class projects and through its curriculum in the areas of entrepreneurship, computer modeling, and multimodal communication.

On the entrepreneurship front, Crown offers entrepreneurship (CRWN 90) and social entrepreneurship (CRWN 92) classes, opportunities for experiential learning getvirtual.org, getvirtual.org, taking care of business, and facilitates interested students access to incubator space and funding opportunities through its partnership with the Center for Innovation and Entrepreneurial Development. Crown also offers an internship with Crown's Center for Applied Ethics and Values of Emerging Technologies to examine in depth the ethical implications of emerging technologies (CRWN 97)

To support computer modeling, Crown offers one class in computer modeling of human behavior (CRWN 88) and one bioinformatics class (CRWN 89).

Crown also offers a variety of classes supporting multimodal communication and artistic expression. This includes a drama class tied to Core (CRWN 96), a videography class (CRWN 86), a podcasting class (Crown 98), and a sci-fi class (CRWN 80).

Crown College is one of the colleges hosting the College Scholars Program, which provides a congenial and challenging academic home for a select group of well-prepared students at UC Santa Cruz. This enriched program of study includes special courses, seminars, colloquia, and other events into the fall of the sophomore year. Admission to the College Scholars Program can be by invitation during the admissions process based on high school academic performance (early entry) or in winter of the freshman year based on academic potential shown during the first quarter at UC Santa Cruz (late entry).

COLLEGE ADVISING

Crown Advising is located in the Crown Administration Building and is staffed by the college assistant, professional academic advisors, and peer advisors, when staff are permitted on campus. Crown Advising offers appointment advising (phone, in-person, or remotely via Zoom) every weekday in fall, winter, spring, and summer. To schedule an appointment, students should use Slug Success (<https://ucsc.campus.eab.com>). For quick questions or completion of most forms, students are encouraged to email crownadvising@ucsc.edu. Please visit our

website for the most up to date information about advisor availability.

CROWN FELLOWS AND STAFF

Crown College faculty fellows are listed on the college's faculty directory.

Crown College Core faculty instructors are listed on our Core Course Faculty directory.

Crown College staff are listed on the college's staff page.

Kresge College

Kresge College Administration Building
831-459-2071
<https://kresge.ucsc.edu>

ACADEMIC PROGRAMS

Academic Literacy Curriculum (p. **Error! Bookmark not defined.**)

College Scholars Program (p. 746)

ACADEMIC EMPHASIS

Kresge was the sixth college to be built on the UC Santa Cruz campus. The college was founded on principles of participatory democracy and experiential education, with a vision of profound social and individual empowerment within an active living and learning community. Its motto is **Power and Representation**.

Kresge College strives to blend the promise of a traditional liberal arts college with its distinctive and prominent legacy of experimental and interdisciplinary education. Its curriculum is designed to create opportunities for **community-building, community-strengthening, and personal growth**, to foster **creative and critical thinking** about the world we live in, to **cultivate good citizenship**, and to **facilitate stewardship of a just and sustainable society**. Kresge College aims to help students of the widest possible range of backgrounds and biographies, to succeed in a path to higher learning at a research institution.

Kresge's academic life is centered on the integration of living and learning in a community that values self-determination, consensus-building, intellectual freedom, sustainability, and justice. These principles take shape in a curriculum that emphasizes participatory learning, hands-on experience, and conscientious academic inquiry that transcends the walls of traditional classrooms. The wide-ranging topics of its curriculum include (but are not limited to) media studies, photography, writers' workshops, cooperative leadership, agro-ecology, natural history, journalism and service learning. Kresge's courses offer varied

ways for Kresge students to fulfill general education requirements while broadening their educational experience in the company of dedicated and imaginative faculty.

The **core curriculum** (see Core Course, below) consists of one required course and a range of elective extensions. All entering first-year students enroll in KRS 1, Academic Literacy and Ethos: Power and Representation, a fall-quarter seminar and plenary-series course that prepares students to develop and engage discourse and knowledge exchange in a university environment, and provides a foundation of questions and aspirations for the intellectual community that will shape Kresge students' whole engagement with their UC Santa Cruz education. Following that course, Kresge students have the option to extend their core learning in courses that deepen those questions into specific domains. KRS 2, Power and Representation and Media, extends the questions of social justice and media representation in a more advanced seminar in media literacy. KRS 3, Natural History Practicum, offers students weekly opportunities to practice critical and empirical reflection on the shared multi-species environment of the UC Santa Cruz campus. KRS 25, Successful Transition to Research University (for the transfer community), and KRS 100, Learning with Intention and Purpose, are intended for the Kresge junior or senior year: they instill students with renewed passion for fundamental principles of liberal arts education, and the relationship of higher learning to the world beyond our campus.

Kresge also boasts a richly varied **enrichment curriculum**, with three distinct emphases:

Service Learning courses (KRS 12A, KRS 12C) support student-initiated in community service and community action, cultivate grant-writing and fund-raising skills, and raise the profile of the college in visible and positive community impacts.

Kresge Labs include KRS 3, Natural History Practicum; KRS 45, Achieving Consensus in Diverse Communities; and the KRS 60 and KRS 65 series on writing and creative work. These are courses in which traditional academic disciplines (ranging from writing, to photography, to natural history, music, and more) are approached in 2- and 3-credit courses for "lay inquiry", fostering learning in which students are the primary critical and collaborative audience for one another's academic work.

The **Common Ground Center** hosts courses on transformative justice (KRS 67, KRS 68, and KRS 69) and leadership and sustainability (KRS 72, KRS 73, and KRS 74). These are courses that support student cooperatives, foster initiatives for sustainability and justice, communication, and contemplative-studies, and support our function as the North American host of the Right Livelihood College.

Students can collaborate with the provost to encourage developments to this curriculum, including proposing

student-driven or student-led courses, or recommending invited lecturers to participate in our core plenary, Media and Society, or Common Ground Center speaker series.

ORIENTATION

All new frosh and transfer students who start fall quarter are required to enroll in one of two online orientation courses. Frosh will enroll in KRS 1A, Kresge 1A: Introduction to University Life and Learning. Transfer students will enroll in KRS 1T, Kresge 1T: Introduction to Research Universities and the Liberal Arts. KRS 1A and KRS 1T integrate introductions to academic skills with the online Slug Orientation process, and begin student preparation for their studies at Kresge College and throughout UC Santa Cruz.

KRS 1A Introduction to University Life and Learning (1 credit)

Offered online in summer quarter

KRS 1T Introduction to Research Universities and the Liberal Arts (1 credit)

Offered online in summer quarter

Students who are admitted to winter quarter will take an orientation course during their first term.

CORE COURSE

KRS 1 Academic Literacy and Ethos: Power and Representation

Offered in fall quarter

Offered to entering frosh, Kresge's core course, KRS 1, Academic Literacy and Ethos: Power and Representation, prepares students for engagement with university discourse. Students read a selected range of contemporary nonfiction and creative work in varied media, developing a practice of interpretation and dialogue that serves as a model for their future academic endeavors. Power and Representation emphasizes texts that reflect on the struggles of individuals and communities to represent and constitute themselves in the United States. In contemplating those struggles, students are encouraged to think beyond easy answers, to express themselves clearly, to reflect on their own thinking and learning styles, and to think critically about their place in a larger world of knowledge and experience. In addition to their seminar meetings, all students in KRS 1 meet periodically with academic mentors—fellow Kresge students who model successful learning styles. The entire core cohort also meets five times during the quarter for the required evening Plenary Series, guest lectures that deepen engagement on specific topics of the course.

Visit Kresge Core Course for additional information about Kresge College academics, including core course requirements and other academic programs.

COLLEGE ADVISING

kresgeadvising@ucsc.edu
Phone: 831-459-2071

Kresge has a team of three academic advisors who work collaboratively with students to support them as they explore majors, navigate university policy, clarify academic goals, and develop strategies for success. Kresge's advisors serve as advocates for students who are experiencing institutional barriers to their success, while also upholding university policy when necessary.

Kresge's advising staff regularly participate in professional development opportunities both on- and off-campus in order to stay abreast of new research and best practices in the wider academic advising community. They celebrate and reflect the diversity of the Kresge student body and seek to model the goal of being lifelong learners.

College advisors work with students from Summer Orientation and Welcome Week through graduation, although much of the interaction is concentrated in the student's first year or two on campus before they've declared a major. Students come to the College Office with all of their questions, and college advisors and front desk staff frequently facilitate connections with other campus resources as appropriate.

In addition to one-on-one in-person and email advising, Kresge's advisors collaborate with the provost, Residence Life office, and campus-wide academic and student support services to offer holistic programming. Past workshops have covered topics such as options for summer enrollment, how to choose a major, and finding family away from home.

OTHER ACADEMIC PROGRAMS

Kresge is a rich and multidimensional academic community, uniquely oriented toward media studies, and known by many as "the writers' college," participatory and consensus-based decision making, service-learning, and cooperative and non-profit leadership.

Kresge is home to the Media and Society series, a lecture series co-organized and co-promoted with Kresge's media-oriented student groups: City on a Hill Press, the Third World And Native American Students Collective Press (TWNAS), and the SCTV Collaborative Curriculum, as well as the Kresge Writing Center (a west-campus home of the UC Santa Cruz Writer's Society, Matchbox Press, Red Wheelbarrow, and the Creative Writing Archives).

The Common Ground Center at Kresge College promotes social and environmental change through undergraduate-focused action-education, research, advocacy, and civic engagement. Our Service Learning courses prepare students to become innovators and activists, through community service projects and grant-writing workshops that connect students' academic lives to the world outside the university. Kresge College also hosts courses related to our student cooperatives: the Kresge Garden Co-op, Photo Co-op, Music Co-op, and Food Co-op.

Merrill College

Merrill College
Merrill College Administration Building
831-459-2144
<https://merrill.ucsc.edu>

ACADEMIC PROGRAMS

Academic Literacy Curriculum (p. **Error! Bookmark not defined.**)

College Scholars Program (p. 746)

ACADEMIC EMPHASIS

Founded in 1968 with a generous gift from Charles E. Merrill, Jr., Merrill College is the fourth of the pioneering living-learning communities at UC Santa Cruz. From its inception it has focused on the challenges raised by global economic disparity, and on solutions that can be imagined when young people have the opportunity to learn via direct experience. Such opportunities are often associated with the social sciences, though Merrill's students and faculty apply them to the full range of academic studies.

The college ethos is "Cultural Identities and Global Consciousness." This pairing signals the college's commitment to drawing on the "funds of knowledge" brought by individual college members to the community of scholars, and a corresponding commitment to understanding these identities within a larger global context.

ORIENTATION

All new frosh and transfer students who start fall quarter are required to enroll in one of two online orientation courses. Frosh will enroll in MERR 1A, Merrill 1A: Introduction to University Life and Learning. Transfer students will enroll in KRSG 1T, Kresge 1T: Introduction to Research Universities and the Liberal Arts. MERR 1A and KRSG 1T integrate introductions to academic skills with the online Slug Orientation process, and begin student preparation for their studies at Merrill College and throughout UC Santa Cruz.

MERR 1A Introduction to University Life and Learning (1 credit)

Offered online in summer quarter

KRSG 1T Introduction to Research Universities and the Liberal Arts (1 credit)

Offered online in summer quarter

Students who are admitted to winter quarter will take an orientation course during their first term.

CORE COURSES

MERR 1, Academic Literacy and Ethos: Reading Ourselves, Reading the World

Offered fall quarter

MERR 1, also known as “Core,” introduces students to analytical reading and critical thinking at the university level. It is the required first part of a larger program of study, the Academic Literacy Curriculum, which includes formal instruction in university-level writing. Core offers students a foundation for intellectual exploration and personal development as members of an academic community. It teaches reading and thinking processes essential to success at the university, and “habits of mind” that demystify academic work and promote independent, self-reflective, and collaborative participation in campus culture. It focuses on Analysis, Critical thinking, Metacognition, Engagement with others across difference, and Self-efficacy (“ACMES,” for short) and assigns carefully chosen readings designed to teach these concepts. Starting in 2021, one section of the Core course will participate in an international education “global classroom” partnership with students from the Cooperative University of Kenya, during which students from both universities will work together remotely—a project meant to encourage global citizenship and to advance the aim of engagement with others.

Students also read a range of texts specific to Merrill’s intellectual traditions. These focus on historical or political flashpoints, particularly those illuminating social, cultural, and economic change in relationships between the developed and the developing world. Students read the daily New York Times, which provides an unfolding narrative about events around the world and offers a valuable opportunity for students to analyze how these events are represented for a U.S. audience. They also read book-length texts and complementary secondary literature. These works show individuals and groups dealing with critical issues of nationalism, globalization, war, economic underdevelopment, and social and gender differentials, and encourage students to examine critically their own underlying assumptions and positions. By closely examining these readings in discussion with others, students develop strategies for effectively engaging different kinds of texts, formulate their own analyses in relation to these readings, and share their ideas in course projects and seminar discussions. The course thus emphasizes skills central to intellectual life at the university: critical reading, analytical writing, oral

presentation of ideas, and reflective consideration of how these ideas and methods apply in other settings.

COLLEGE ADVISING

Contact Information:

merrilladvising@ucsc.edu

Phone: 831-459-2144

Merrill College Administration Building

Merrill College advisors help students interpret academic policies and procedures and clarify educational goals. They provide support to students to ensure their academic success and progress toward their degree throughout their time at UC Santa Cruz. Advisors help students make informed decisions, develop resiliency, and develop the ability to take ownership of their academic choices. Advisors also connect students to resources that will enrich their academic experiences.

OTHER ACADEMIC PROGRAMS

Merrill College offers several funding opportunities for experiential education. These include the Merrill Undergraduate Research Mentorships, which provide students with paid research internships and prepare advanced undergraduates to pursue graduate studies. These internships provide invaluable research experience and personal and professional development for Merrill students. The Sandra Frausto Education Abroad Scholarship provides a modest scholarship to one qualified undergraduate annually to study in Latin America. Finally, eligible students may apply for Merrill special projects funds and campus-backed research funds.

The college also sponsors a variety of two-, three-, and five-credit courses. A key characteristic of Merrill’s academic program from its founding has been the importance of experiencing the world, not just studying it. Thus Merrill’s academic programming focuses especially on theory-backed experiential learning. Merrill offers a field study practicum that teaches methods of responsible participant observation and helps students arrange internships in local agencies and organizations. An education-focused service-learning course, Classroom Connection, addresses current issues in educational theory and arranges for students to volunteer in local public schools.

In keeping with Merrill’s spirit of community-mindedness, we offer a Careers in Public Service course that features Merrill alumni as weekly speakers. Several other courses also help prepare students for their professional lives: Careers in STEM provides students with information, tools, and strategies to embark on STEM career exploration and preparation, including strategies for addressing challenges and opportunities related to diversity within STEM career fields. Also, a series of leadership courses is open to students

involved in any of UC Santa Cruz's many registered student organizations. This series teaches principles of critical engagement, collaboration, and organizational leadership for social change.

Continuing the college's long history of involvement with Africa studies, Merrill also offers the alumnu-led Focus on Africa course which, like Core, now involves a remote partnership with university students in Kenya. Eligible first-year students are also invited to join the College Scholars Program, which provides a series of stimulating research-based opportunities (a speaker series, seminars, and research funding opportunities) via two pathways: "fall start" commences with students' first quarter of enrollment as frosh, and "spring start" enrolls a second cohort the following spring.

Oakes College

Oakes College Office, Oakes Administration Building
(831) 459-2558
<https://oakes.ucsc.edu/>

Academic Programs

Academic Literacy Curriculum (p. **Error! Bookmark not defined.**)

College Scholars Program (p. 746)

Community Studies (p. **Error! Bookmark not defined.**)

Community-based Advocacy and Research (CARA) Certificate Program (p. 738)

Academic Emphasis

Oakes College is a multicultural community committed to social justice, freedom from oppression, and to providing the highest quality education to students from diverse backgrounds. Oakes is at the leading edge of scholarship, community-building, integrated co-curricular experiences, and community-engaged learning. Oakes students strive to understand the self, community, and systemic oppression, and take action for change in the world.

The Oakes College faculty represents a wealth of expertise from the natural sciences to the humanities, and we are proud to have some of the top scholars in the world among our faculty fellows. Our students major in every discipline at UC Santa Cruz—from economics and computer science, to theater arts and Latin American and Latino studies—and they are well supported by the depth and breadth of the Oakes College faculty and the extensive knowledge of our advising team. Oakes graduates have gone on to successful careers in fields such as medicine, law, education, medical research, and community service.

The Oakes Core Course, Communicating Diversity for a Just Society, helps first-quarter, first year students build deeper critical connections by engaging with some of the most challenging and relevant issues that face us in the world. We do this by examining the

intersections between reading, personal identity, and social justice. In our readings, discussions, and assignments, we seek to answer questions about how materials we read connect with our cultural, religious, sexual, ethnic, class, racial, and gender identities. Those who are admitted as transfer students are exempt from the Core Course requirement, but may take the course at their option pending available space.

Orientation

All new frosh and transfer students who start fall quarter are required to enroll in one of two online orientation courses. Frosh will enroll in OAKS 1A, Oakes 1A: Introduction to University Life and Learning. Transfer students will enroll in KRSG 1T, Kresge 1T: Introduction to Research Universities and the Liberal Arts. OAKS 1A and KRSG 1T integrate introductions to academic skills with the online Slug Orientation process, and begin student preparation for their studies at Oakes College and throughout UC Santa Cruz.

OAKS 1A Introduction to University Life and Learning (1 credit)

Offered online in summer quarter

KRSG 1T Introduction to Research Universities and the Liberal Arts (1 credit)

Offered online in summer quarter

Students who are admitted to winter quarter will take an orientation course during their first term.

Core Course

OAKS 1, Academic Literacy and Ethos: Communicating Diversity for a Just Society (5 credits)

Offered fall quarter

This course examines the intersections between reading as a college student practice, personal and social identities, and social justice. In our readings, discussions, and assignments, we seek to answer questions about how materials we read connect with our cultural, religious, sexual, ethnic, class, racial, and gender identities. How have our own ways of identifying—of naming or defining ourselves—shaped our individual experiences? Where do we position our own stories within our shared family histories? How do our own autobiographies and essays, as written accounts of our process of identification, bring our search for ourselves and our relationship with reading and writing into the same conversation?

College Advising

First floor, Oakes Administration Building

Mailing address:

The Office of Advising and Records
Oakes College
University of California, Santa Cruz

1156 High Street
Santa Cruz, CA 95064

Contact information:
oakesadvising@ucsc.edu
(831) 459-4531

At Oakes College, our role as college advisers is to serve as the first point of contact for our undergraduate students. We believe that effective advising mandates that we collaborate with students to identify and clarify their goals, develop a sense of self-authorship, and learn to make meaningful decisions about their lives. We ensure our students know that their educational trajectory extends beyond coursework, and includes opportunities and experiences that will enhance their education.

Investing in an advising model where a student's lived experience is an educational asset, we advance our practices and become more engaged and proactive in our work. Our Oakes college advisers advocate for necessary policy and procedural changes. We address institutional barriers by engaging with justice rather than simply adopting it as a value. In turn, we aspire for students to see the greater meaning of their educational experience and how it can transform their lives beyond their undergraduate career.

The purview of colleges advising includes navigating campuswide requirements such as general education, academic progress, time to degree, and major selection and qualification.

Other Academic Programs

At Oakes College, we foster student engagement and leadership within and beyond the classroom. To this end, we encourage students to develop the knowledge, skills, and cross-cultural understanding necessary to become actively engaged people and future leaders in their own communities, workplaces, and academic disciplines as well as in the larger U.S. society and the world as a whole. We also provide a range of resources and programs that enable all students to succeed in their academic endeavors. Such resources include:

The Learning Center and the **Westside Writing Center** at Oakes College provide space for study groups as well as tutoring. Special assistance in academic reading and writing in a variety of subjects is offered to Oakes students.

The Oakes Computer Lab provides access to 20 PCs for Oakes students.

Co-curricular programs like the **Oakes Core Café**, and the residential **Science Community at Oakes College** all offer living-learning opportunities to enhance student success and to provide students with unique opportunities for interacting with faculty in small group contexts.

The Oakes College CARA Program. The Community-based Action Research and Advocacy

(CARA) Program of Oakes College works to create opportunities for experiential education, leadership, research, and career development; we center the strengths and needs of first-generation college students and projects for transformative social justice. Courses emphasize community-building along with research and communication techniques within the critical frameworks that build confidence and support justice initiatives. The program includes a development and outreach strategy with campus and community groups—including schools, youth sites, direct-service provider networks, and grassroots organizations, both on-campus and off. Upper-division courses are commonly accepted as major requirement substitutions in multiple departments. The *Corre la Voz* after-school program offers paid student leadership positions; the Puentes Program, in collaboration with Legal Studies, sponsors interns. Oakes students can earn a CARA certificate by completing a sequence of community-engaged coursework focused on social justice.

Student services at Oakes include academic advising and psychological counseling.

CARA Certificate Program

The Oakes Community-based Action Research and Advocacy (CARA) program builds on the mission of Oakes College to leverage university-based education for social and political change. Our courses support Oakes students to build connections with community-based organizations and to gain tangible skills they can leverage for social justice in various contexts, from grassroots activism to working with nonprofits, public agencies, and beyond. The CARA program also supports first-generation, low-income, students of color, undocumented and other student communities to make meaningful connections that bridge their academic studies to social justice issues that are most pressing for their communities and their own lives.

CARA courses pose rigorous, interdisciplinary academic questions about how to expand justice within and across contexts. Students connect course readings, seminar practice, reflexivity, and writing with their field-based research projects or internships, often in partnership with local organizations. In the process, students develop a variety of skills, from conducting qualitative research to analyzing data, communication, mentorship, advocacy, and more, deepening their own understanding and capacities to contribute to social justice initiatives. In addition, many CARA courses also support students to complete their general education requirements.

While any student may enroll in our community-engaged research and learning courses, our aim is to support Oakes students to complete the CARA Certificate. The CARA Certificate is awarded to students upon their successful completion of at least 19 credits, as outlined in the four program areas. Students should notify the CARA program director and community liaison via email that they've successfully

completed the program courses, or of their intent to complete in their last quarter of the CARA program (oakscara@ucsc.edu). The CARA program director will also accept petition requests for other courses that fit the programmatic themes, per written request of the student and submission of the course syllabus. Courses listed in more than one program area can count toward each area, provided a total of 19 credits are completed across all four areas.

Students are encouraged to list the CARA Certificate in their resumes, in addition to articulating the skills they've developed through program courses. The CARA Certificate will not appear on students' transcripts.

OAKES CARA CERTIFICATE 2021-22

Students who successfully complete a minimum of 14 credits from the following courses qualify for the Oakes CARA Program Certificate. Students can choose any of the classes in order to qualify.

Building Capacities for Community Voice, Advocacy, and Organizing

OAKS 47 Building An Inner Sanctuary, 2 credits, PR-S
OAKS 48 Slugs Speak, 2 credits, PR-S
OAKS 67 The Politics Of Food: Labor and Social Justice, 2 credits
OAKS 70 Diverse Voices In Contemporary American Women's Poetry, 2 credits, PR-C
OAKS 73B Mentoring, 2 credits, PR-S
OAKS 80H Rainbow Theater, 5 credits
OAKS 130 Creative Writing Workshop, 5 credits, PR-S

Community Voice, Advocacy and Organizing in Practice

OAKS 151 Corre la Voz, 5 credits total, PR-S (A&B)
OAKS 167 Food Systems: Culture, SJ, Sustainability, 5 credits, PR-S
OAKS 185 Tracing Health, 5 credits, PE-H
OAKS 188 Intro to the Legal Profession and Legal Aid, 5 credits, PR-S (A&B)
OAKS 189 Building Websites For Social Justice, 2 credits, PR-S

Community-based Action Research

OAKS 76 Social Geography & Justice in Santa Cruz, 5 credits, PR-S
OAKS 152 Transformative Literacies, 5 credits, PR-S
OAKS 153 Community Mapping, 5 credits, PR-S
OAKS 155 Research for Social Justice: Special Topics, 5 credits, SI

Porter College

Porter College Office, D-Building
831-459-2273
<https://porter.ucsc.edu>

ACADEMIC PROGRAMS

Academic Literacy Curriculum (p. **Error! Bookmark not defined.**)

College Scholars Program (p. 746)

ACADEMIC EMPHASIS

Porter College was founded in 1969 as the fifth of UC Santa Cruz's residential colleges and was later renamed in honor of a generous grant from the Porter-Sesnon family. Its mission is to foster achievement in all areas of study. Porter is especially dedicated to achievement in the arts and humanities, believing that creative and humanistic inquiry are essential parts of a rigorous and broad-minded education, a flourishing society, and a happy life.

Porter College fellows hail from every academic division on campus and from many non-academic professions, but all of them share the philosophy of education that the college's curriculum embodies: first, discover how to learn; then, learn by doing; and finally, let your learning make a difference in the world.

The Porter College curriculum encourages students to explore unusual topics and provocative ideas, to test and revise hypotheses about the meaning of their experiences, to learn from the failures that are an inevitable part of new learning and discovery, and to assume responsibility for the decisions they make in their studies. In addition to core courses for first-year students, which provide rigorous training in critical reading and writing and study skills, Porter offers a variety of smaller interdisciplinary seminars that combine historical and theoretical approaches to the arts, humanities, and sciences with practical experience conducting scholarly research and making creative work.

ORIENTATION

All new frosh and transfer students who start fall quarter are required to enroll in one of two online orientation courses. Frosh will enroll in PRTR 1A, Porter 1A: Introduction to University Life and Learning. Transfer students will enroll in KRSG 1T, Kresge 1T: Introduction to Research Universities and the Liberal Arts. Porter 1A and Kresge 1T integrate introductions to academic skills with the online Slug Orientation process, and begin student preparation for their studies at Porter College and throughout UC Santa Cruz.

PRTR 1A Introduction to University Life and Learning (1 credit)

Offered online in summer quarter

KRSG 1T Introduction to Research Universities and the Liberal Arts (1 credit)

Offered online in summer quarter

Students who are admitted to winter quarter will take an orientation course during their first term.

Core Course

PRTR 1, Academic Literacy and Ethos: Arts of Reading, Offered fall quarter

PRTR 1 teaches foundational concepts for intellectual exploration and personal development within an academic community: analysis, critical thinking, metacognition, engagement with others across difference, and self-efficacy. Engages Porter's intellectual tradition of investigating the contribution the arts and humanities make to a good life, a just society, and a flourishing world.

Requirements: Enrollment is restricted to first-year college members.

Credits: 5

Quarter Offered: Fall

Instructor: Provost Casel

COLLEGE ADVISING

porteradviser@ucsc.edu
Phone: 831-459-2273
Porter D-Building, Room 104

Porter College advisers help students interpret academic policies and procedures and clarify educational goals. They provide support to students to ensure their academic success and progress toward their degree throughout their time at UC Santa Cruz. Advisers help students make informed decisions, develop resiliency, and develop the ability to take ownership of their academic choices. Advisers also connect students to resources that will enrich their academic experiences.

OTHER ACADEMIC PROGRAMS

Porter College offers fellowships and grants to students and faculty in support of scholarly and creative projects. Among the grants offered annually are the Porter College Undergraduate Fellowship (PCUF), the Porter College Research Assistantship (PCRA) and the Nathan Foley Mendelssohn Memorial Travel Scholarship (NFM).

Rachel Carson College

Rachel Carson College Administration Building, Room 114
831-459-2361
<https://rachelcarson.ucsc.edu>

ACADEMIC PROGRAMS

Academic Literacy Curriculum (p. **Error! Bookmark not defined.**)

College Scholars Program (p. 746)

Sustainability Minor (p. 741)

ACADEMIC EMPHASIS

Rachel Carson College's academic classes focus on the theme of environment and society. The college sponsors a number of educational initiatives and courses aimed at furthering its theme and mission, as well as programs offering experiential learning for students. CRSN 1 is the required first-year college core course, part of the Academic Literacy Curriculum that introduces students to critical and analytical reading at the university level. The core course is mandatory for all incoming frosh.

ORIENTATION

All new frosh and transfer students who start fall quarter are required to enroll in one of two online orientation courses. Frosh will enroll in CRSN 1A, Rachel Carson 1A: Introduction to University Life and Learning. Transfer students will enroll in KRSG 1T, Kresge 1T: Introduction to Research Universities and the Liberal Arts. CRSN 1A and KRSG 1T integrate introductions to academic skills with the online Slug Orientation process, and begin student preparation for their studies at Rachel Carson College and throughout UC Santa Cruz.

CRSN 1A Introduction to University Life and Learning (1 credit)

Offered online in summer quarter

KRSG 1T Introduction to Research Universities and the Liberal Arts (1 credit)

Offered online in summer quarter

Students who are admitted to winter quarter will take an orientation course during their first term.

CORE COURSE**CRSN 1, Academic Literacy and Ethos: Environment and Society**

Offered fall quarter

The Rachel Carson College core course focuses on the theme "Environment and Society," through examination of California's environment history and how the contemporary landscape has been shaped by capital, labor, technology and politics. A secondary focus is on food: how it is grown, who works in the fields, and why some are malnourished in the midst of agricultural plenty. The course also considers the ecological and environmental histories of California—the shape and biology of the land as well as the role of people in shaping the state's many landscapes; what novels,

stories and articles can tell us about environment and society in California; the central role of water, soil and species in shaping society; and the potential impacts of climate change on both land and society. In pursuing these topics, students also delve into some of the environmental and ecological science that underpins them. The course consists of a weekly plenary (large lecture) and a bi- or tri-weekly seminar (discussion section).

COLLEGE ADVISING

carsonadvising@ucsc.edu
Phone: 831-459-2361
Rachel Carson College Administration Building, room 114

Rachel Carson College advisers help students interpret academic policies and procedures and clarify educational goals. They provide support to students to ensure their academic success and progress toward their degree throughout their time at UC Santa Cruz. Advisers help students make informed decisions, develop resiliency, and develop the ability to take ownership of their academic choices. Advisers also connect students to resources that will enrich their academic experiences.

OTHER ACADEMIC PROGRAMS

In addition to the core course, practicum internships, research projects, and a minor in sustainability studies all enable students to acquire skills that they can apply to their career at UC Santa Cruz, including service-learning work with campus and community-based agencies and organizations. Additional college courses include garden internships, academic and STEM preparation classes, student-facilitated classes in sustainability, a class on peregrine falcons, and a seminar on environment in film. For more information about academics, see Rachel Carson College.

Sustainability Studies

Rachel Carson College Office
(831) 459-2361
<https://rachelcarson.ucsc.edu/>

SUSTAINABILITY STUDIES MINOR

Among the most critical societal challenges of the next 50 years are the rapidly growing and linked ecological and social crises arising from stresses on supplies of energy, water, food, and other natural resources. These crises are not simply about the adequacy of supply relative to demand, however; they are also the result of the complex social relations within and among societies, in the past, present, and future. Dealing with such socio-ecological problems therefore requires

robust interdisciplinary collaborations among engineers, social scientists, and natural scientists. Moreover, in today's rapidly-changing economy, college graduates will need to be flexible and adaptable, able to learn new knowledge and skills rapidly, and cognizant of the complex organization of society and technology. The minor in sustainability studies administered by Rachel Carson College takes a "learning by doing" approach to prepare students as change-makers equipped with professional conduct, analytic abilities, and practical know-how.

The pedagogical underpinnings of this minor are premised on relationships between classroom learning, character development, community engagement, and research and application. Broad interdisciplinarity and individual facility in both STEM and social sciences are critical elements at the center of the minor's core courses. The curriculum is therefore structured to 1) facilitate interdisciplinary academic and research collaborations among faculty and students across multiple UC Santa Cruz divisions (drawing on but **outside** of the divisional structure) and in the off-campus community; 2) teach and train students in **ecology and sustainability** for regenerative design thinking, entrepreneurship and impact assessment in the **built and natural environment**; 3) integrate the use of science, technology, engineering, and mathematics (STEM) skills and social science knowledge to these ends; and 4) meet undergraduate demand for a sustainability curriculum with focuses distinct from those offered in existing UCSC departments.

The program is designed to graduate students who can design and conduct interdisciplinary design research projects in issues and topics that are related to sustainability, including energy, food, water, the built environment, life-cycle analysis, waste disposal and recycling, coastal and marine conservation, and natural resource management. During the program, students will design and participate in service-learning projects in collaboration with on- and off-campus units, agencies, and organizations; and apply the knowledge and skills acquired through the minor.

No specific prior preparation or prerequisites are required for entry to the minor.

Program learning objectives are as follows:

- Demonstrate whole system awareness with the ability to identify and understand interconnectedness (intersecting, related and/or connected systems; synergies and rebound effects) and how all human-made designs rely upon and are embedded within nested ecological systems.
- Demonstrate awareness that a design is a system, that users interact with designs and that designs and users are embedded in higher level systems that include environmental ecosystems and the life they sustain.

- Demonstrate knowledge and understanding of whole life-cycle and closed-loop systems thinking as related to the impact of mitigation work (e.g., understanding of life-cycle burdens of design alternatives).

- Comprehend and apply understanding of the causes, features, data, complexities, policies, and practices giving rise to and needed to address a perceived crisis in the contemporary global socioecological context including the role of production, consumption, politics, policies, markets and human behavior in this crisis.

- Show proficiency in applying basic STEM skills needed for evaluation and design practices in real-world applications including quantitative and qualitative metrics for impact and risk assessments and a selection of software and hardware-specific skills (e.g., computer animated design, 3D printing, Arduino programming etc.) Use cognizance of appropriate social science knowledge/methods and entrepreneurial practices to design and implement social enterprise and service learning projects in sustainability and ecological design and practice.

- Demonstrate the ability to forecast the near- and long-term costs and value of their work to the environment and society through the efficient use of resources (e.g., efficient for whom?) and socially/culturally responsible engagement with stakeholders.

- Show awareness of risks and opportunities related to changing environments on their work (e.g., extended costs, value, trade-offs, partnerships, regulations, policies, etc.).

- Demonstrate the ability to identify relevant cultural implications and influences in the context of their work (e.g., cultural expressions and sensitivities, services and goods procurement, heritage site appreciation) as well as equity awareness (e.g., gender, race, ethnicity, class, etc.).

- Feel familiar with ways to create robust, dynamic, and resilient systems and ways to develop transdisciplinary stakeholder networks.

- Understand ethical implications relative to social impact of their work.

Course Requirements

Substitutes for any of the required courses must be approved by the program director.

Lower-Division Courses

One of the following courses

ECE 80G	Creating and Financing a Sustainable Startup in the Global Economy	5
ECE 80H	Bending the Curve: Solutions to Climate Change	5
ECE 80S	Sustainability Engineering and Practice	5

- ECE 80G/CRSN 80G is offered in the summer

- ECE 80H/CRSN 80H is offered in the spring

- ECE 80S/CRSN 80S is offered in the fall

And two quarters of CRSN 55 (2 credits per quarter)

CRSN 55	Rachel Carson College: Service Learning Practicum	2
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Students shall complete two quarters of CRSN 55 (2 credits per quarter). CRSN 55 is offered all three quarters.

Upper-Division Courses

The following three courses are required

CRSN 151A	Sustainability Praxis in the Natural and Built Environment	5
CRSN 151B	Innovation and Professionalization for Sustainability Designers, Engineers, and Entrepreneurs	5
CRSN 151C	Sustainability Laboratory Tools, Techniques, and Applications	3

CRSN 151C will be offered all three quarters (fall, winter, and spring). This course can be repeated for credit as topics change.

Upper-Division Options

Option 1

The following course:

CRSN 161	Education for Sustainable Living Program	5
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CRSN 61 may be substituted for CRSN 161 if the student otherwise has sufficient upper-division credit (25 credits of required courses and electives). Students should discuss with the sustainability minor academic coordinator to determine if they have sufficient upper-division credits.

IDEASS Capstone

Plus three quarters (6 credits total) of CRSN 152.

CRSN 152 has four sections 01-04, each offering a different topic. The three quarters must cover three different topics. All four topics are offered fall, winter, spring annually.

This is considered the capstone for the minor. Students may substitute two breadth electives if they are not able to complete a capstone IDEASS project.

CRSN 152	IDEASS Laboratory Practicum	2
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Breadth Requirement

Plus one 2-credit or one 5-credit breadth elective (see list of Breadth Electives course list below).

Option 2

Take a second quarter of CRSN 151C (the two quarters must cover different skill sets, e.g., 3D printing vs CAD drawing), a 5-credit breadth elective (see list of Breadth Elective courses below), and complete the IDEASS capstone (three quarters of CRSN 152; see Option 1 for more details).

Option 3

The following course:

CRSN 161	Education for Sustainable Living Program	5
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CRSN 61 may be substituted for CRSN 161 if the student otherwise has sufficient upper-division credit (25 credits of required courses and electives). Students should discuss with the sustainability minor academic coordinator to determine if they have sufficient upper-division credits.

Breadth Requirement

Plus two breadth electives for a minimum of 7 credits (either a 2-credit and a 5-credit course, or two 5-credit breadth electives at the student's discretion). See Breadth Electives course list below.

Breadth Electives

The following list of breadth elective courses applies to all of the upper-division options above.

Breadth Electives

ANTH 110K	Culture Through Food	5
ANTH 110W	Land and Waterscapes Entropology	5
ANTH 111	Human Ecology	5
ANTH 135A	Cities	5
ANTH 137	Consuming Culture	5
ANTH 146	Anthropology and the Environment	5

ANTH 147	Anthropology and the Anthropocene	5
ANTH 160	Reproductive and Population Politics	5
ANTH 161	The Anthropology of Food	5
ART 125	Environmental Art Studio	5
CLTE 105	The Making and Influencing of Environmental Policy	5
CMMU 133	Making California: Landscapes, People, Politics, Economy	5
CMMU 149	Political Economy of Food and Agriculture	5
CMMU 156	Politics of Food and Health	5
CMMU 162	Community Gardens and Social Change	5
CMMU 186	Food and Agriculture Social Movements	5
CMPM 80L	Entrepreneurial Organization and Leadership	5
EART 107	Remote Sensing of the Environment	5
EART 116	Hydrology	5
EART 121	The Atmosphere	5
EART 142	Engineering Geology for Environmental Scientists	5
EART 146	Groundwater	5
EART 191A	Climate Change Science and Policy	5
EART 191B	Planetary Capstone	5
EART 191C	Practical Geophysics	5
BIOE 107	Ecology	5
BIOE 108	Marine Ecology	5
BIOE 145	Plant Ecology	5
BIOE 147	Community Ecology	5
BIOE 155	Freshwater Ecology	5
ECON 170	Environmental Economics	5
ECON 171	Natural Resource Economics	5
ECON 175	Energy Economics	5
ECE 175	Energy Generation and Control	5
ECE 175L	Energy Generation and Control Laboratory	2
ECE 176	Energy Conservation and Control	5
ECE 176L	Energy Conversion and Control Laboratory	2
ECE 177	Power Electronics	5
ECE 177L	Power Electronics Laboratory	2
ECE 180J	Advanced Renewable Energy Sources, Storage, and Smart Grids	5
ENVS 149	Environmental Law and Policy	5
ENVS 152	International Environmental Politics	5

FMST 124	Technology, Science, and Race Across the Americas	5
FMST 133	Science and the Body	5
HIS 101C	Oceans in World History	5
HIS 177	Smoke, Smallpox, and the Sublime: Thinking about the Environment in the 19th Century	5
HIS 196F	Topics in European Environmental History	5
HAVC 141I	Be Here Now: Art, Land, Space	5
HAVC 141K	Activist Art Since 1960: Art, Technology, Activism	5
HAVC 143B	History of Urban Design	5
LALS 152	Consumer Cultures Between the Americas	5
LGST 131	Wildlife, Wilderness, and the Law	5
LGST 137	International Environmental Law and Policy	5
LGST 159	Property and the Law	5
METX 101	Sources and Fates of Pollutants	5
METX 144	Groundwater Contamination	5
OCEA 101	The Marine Environment	5
OCEA 102	Oceans and Climate: Past, Present, and Future	5
PHIL 125	Philosophy of Science	5
POLI 132	California Water Law and Policy	5
POLI 174	Global Political Ecology	5
PSYC 159E	Peace Psychology	5
SOCY115	Green Governance	5
SOCY 119	Sociology of Knowledge	5
SOCY 125	Society and Nature	5
SOCY 130	Sociology of Food	5
SOCY 132	Sociology of Science and Technology	5
SOCY 167	Development and Underdevelopment	5
SOCY 173	Water	5
SOCY 177E	Eco-Metropolis: Research Seminar in Urban and Environmental Studies	5
SOCY 177G	Global Cities	5
SOCY 179	Nature, Poverty, and Progress: Dilemmas of Development and Environment	5

Substitutes for any of the required classes must be approved by the program director.

Stevenson College

Stevenson College
 (831) 459-2020
stcollege@ucsc.edu
<https://stevenson.ucsc.edu>

Cowell-Stevenson Collaborative

ACADEMIC EMPHASIS

The faculty at Stevenson, drawn from a variety of disciplines in the social sciences, humanities, engineering, and physical and biological sciences, share a common concern for the study of social processes that shape modern society and determine the quality of our individual lives throughout various global regions and periods of world history. Linguistics, history, sociology, politics, psychology, biology, chemistry, and computer science are strongly represented in the college.

Stevenson distinguishes itself as the only college with a required two-quarter core course intended to provide all first-year students with a common academic experience. The core course allows for more rigorous development of students' critical, reading, and analytical skills. It provides a unique learning environment and a supportive intellectual community for all Stevenson first-year students. Those admitted as transfer students are exempt from the core course requirement but may take the core course at their option pending available space.

Stevenson's second quarter of the core course satisfies a further general education requirement, the TA, or textual analysis designation.

Students in majors that have a large number of course requirements should consider how they plan to fit both the two-quarter college core course and their intended major's first-year requirements into their first year at UC Santa Cruz.

Students are encouraged to consult with both their college and major advisors. Stevenson College advisors can be found on the Stevenson advising website.

Students who are placed in the Multilingual Curriculum when they enter UC Santa Cruz will be required to take only the first quarter of the core course requirement.

The Stevenson core course, Self and Society, enables students to examine the nature of the self and the relationship of the individual to society. It teaches foundational concepts for intellectual exploration and personal development within an academic community—analysis, critical thinking, metacognition, engagement with others across difference, and self-efficacy. In addition, the course fosters an intellectual commitment to the general philosophy that has helped to define Stevenson College since its inception: preservation of human dignity, the social cultivation of individual creativity and citizenship, and a belief in ethical responsibility. The core course reflects the college's long-standing commitment to interdisciplinary and culturally diverse readings, while at the same time affording students an opportunity to develop research interests, to acquire greater understanding of the role of research universities in contemporary societies, and to

acquire the requisite skills to engage in increasingly more sophisticated intellectual work while at UCSC.

ORIENTATION

All new frosh and transfer students who start fall quarter are required to enroll in one of two online orientation courses. Frosh will enroll in STEV 1A, Stevenson 1A: Introduction to University Life and Learning. Transfer students will enroll in KRSR 1T, Kresge 1T: Introduction to Research Universities and the Liberal Arts. STEV 1A and KRSR 1T integrate introductions to academic skills with the online Slug Orientation process, and begin student preparation for their studies at Stevenson College and throughout UC Santa Cruz.

STEV 1A Introduction to University Life and Learning (1 credit)

Offered online in summer quarter

KRSR 1T Introduction to Research Universities and the Liberal Arts (1 credit)

Offered online in summer quarter

Students who are admitted to winter quarter will take an orientation course during their first term.

CORE COURSES

STEV 1: Academic Literacy: Self and Society, offered fall quarter

Introduction to University Discourse: Self and Society. College 1 helps students develop academic and civic proficiency in reading, critical thinking, and “academic ethos,” and habits of mind and practice tied to a sense of belonging and academic success. This course prepares students for success in other UC Santa Cruz courses requiring critical thinking, listening, discussion, and effective communication. It explores rhetorical principles and conventions of university discourse and considers the roots of modern society using foundational religious texts and major classical and modern philosophical works. Enrollment is restricted to first-year college members.

STEV 2: Academic Literacy: Self and Society 2, offered winter quarter

The winter quarter class that follows College 1 continues the development of critical reading, analysis, and effective speaking exploring conflicts inherent in modern society. The course fulfills the TA GE and investigates themes of colonization, race, gender, class, as well as cultural conflict. Enrollment is restricted to first-year and sophomore college members.

OTHER ACADEMIC PROGRAMS

Scholarships

Students have the opportunity to apply for funding for special research projects each quarter. Stevenson also provides several annual scholarships and service awards, including the Josh Alper Marines Memorial Award, the Michele Guard Memorial Scholarship, the Matthew Graviano Memorial Scholarship, the John Halverson Scholarship, and the Robert Dodge Service Award.

Junior Fellow Program

The Stevenson College Junior Fellows Program offers juniors and seniors an opportunity to serve as instructors in Self and Society. Junior fellows, who must have completed outstanding work in Self and Society during their first year, undergo a rigorous application and selection process. Junior fellows (enrolled in Stevenson 120, Teaching Practicum) earn five course credits.

Writing Assistance

Stevenson provides writing assistance for all of its students. Stevenson Writing Assistantships are paid student positions open to juniors and seniors with excellent academic records. Click here for additional information about the Stevenson College academic events.

COLLEGE ADVISING

Located in the Stevenson College Office in the Stevenson Administration Building, Rooms 118-119 across from the Stevenson Coffee House patio.

To schedule an appointment, contact the Stevenson College Office at stevensonadvising@ucsc.edu; phone number 831-459-4930.

Appointments: Daily 9:00 a.m.-4:00 p.m.

Drop-in Advising: Monday-Wednesday and Friday, 10:30 a.m.-11:30 a.m., and Monday-Friday, 1:30 p.m.-2:30 p.m.

The Stevenson advising staff assists students in their academic endeavors by providing them with guidance, support, and information. They advise students on many issues, ranging from helping them select their first UCSC classes to making sure that they’ve fulfilled all graduation requirements. Advisors provide students with tools and resources so that they feel confident and empowered to navigate the university.

Advisors encourage students to enter into an active partnership with staff and faculty to ensure that they will learn about existing programs, deadlines, procedures, and opportunities. Advisors also encourage students to become involved in the many extra-curricular activities available at the college. Stevenson students pride themselves on being the most politically active on campus. With this involvement comes the responsibility of maintaining academic goals as a priority. Advisors help students maximize their

potential and balance their commitments inside and outside of the classroom so that they can get the most out of their education during and after their time at Stevenson.

College Scholars Program

PROGRAM OVERVIEW

The UC Santa Cruz College Scholars Program (CSP) offers a congenial and stimulating academic home for a select group of well-prepared first-year students at UC Santa Cruz. Through this honors program, students can expect to challenge themselves academically, find other students who are similarly motivated, and explore undergraduate research. This enriched program of study includes special courses, seminars, colloquia, and other events during each quarter of the student's first academic year and fall of the student's second academic year.

CSP provides an opportunity for outstanding students to engage deeply with the best of UCSC. Early in their career, students are able to explore the full potential of the university setting, beyond the coursework that might be required in their respective disciplines.

CSP has close ties to the college system. In 2018-2019, Fall Start scholars (see below for information about Spring Start scholars) will live at Cowell, Crown, Merrill or Porter College. Each college will have a cohort of about 20-25 College Scholars Program students, and students in each cohort will be housed together. Students receive priority enrollment during their time in the program.

COLLEGE SCHOLARS PROGRAM CURRICULUM

The CSP academic program is designed to both challenge participants and give them the opportunity to develop a strong foundation in our research university.

Year 1

Fall Quarter 1—Supplement to College "Core Course": Students will take part in a series of gatherings led by the Faculty Director and the Provosts at the four Fall Start colleges. These meetings are meant to supplement their college "core course" and to build relationships with other CSP students.

Winter Quarter 1—Service Learning Course: All students will take a two-credit service-learning course offered through Cowell College (COWL 168). This course includes three main components: classroom meetings, journal reflections and papers, and placement in a local organization. Guest speakers are a part of the class and in the past have included local alumni and elected public officials, all working to promote positive social change locally, nationally, or internationally. Over the course of the term, students contribute 40

hours of work to an organization in the community. Organizations that have welcomed students in the past include: the Homeless Service Center, Rising International, Santa Cruz Boys and Girls Club, and the Museum of Art and History.

Spring Quarter 1—Faculty Research Colloquium: Students will take a two-credit course (COWL 89) where weekly faculty lectures are followed by dinner at one of the Provosts' houses. Each student is invited to attend one dinner during the term.

Faculty guests will be drawn from a variety of fields within the university, and students will be encouraged to listen to and appreciate scholars and scholarship beyond their own comfortable niche in engineering, biology, linguistics, music, or whatever their area of interest may be. The invited scholars will be speaking not only about the substance of their work, but also about the types of questions that are particular to their fields of study. By the end of the course, students should have a good sense of the modes of inquiry that animate intellectual life in a research university.

Year 2

Fall Quarter 2—Seminar: Students choose from one of several five-unit research seminars. Each of the seminars focuses on developing significant hands-on skills: whether it is a chance to "do real science" through guided research in the field and in a lab, or address important primary sources directly and debate them together in a text-centered seminar room, students will get training in the real intellectual work that scholars do.

College Scholars Programs: Fall Start and Spring Start

Fall Start—Invitation Only: Admission to the Fall Start cohort of College Scholars Program is by invitation only. A select group of UCSC applicants who are offered admission to the university will be invited to join the program, based on their record of academic achievement. Those students who accept the invitation will be housed together at either Cowell, Crown, Merrill, or Porter College.

Spring Start: Students can apply to the College Scholars Program after the Fall quarter of their first year. In this case, students accepted into CSP will join the program in Spring quarter and will participate in the spring research colloquium. Spring Start students will be selected based on applications reviewed through their college. Students may apply to Spring Start from any of UCSC's colleges.

PHYSICAL EDUCATION

East Field House
(831) 459-5076
goslugs.com
recreation.ucsc.edu

Physical education (P.E.) offers students an opportunity to learn and improve skills in a variety of areas while gaining knowledge about the relationship between fitness and wellness. With this information, students will be better prepared to make important choices leading to healthy lifestyles.

Physical education courses at UC Santa Cruz, which are elective and without academic credit, are offered in a wide variety of activities. The courses consist of instruction, practice, and full participation consistent with each student's ability. While many of the courses are for students at a beginning level, some are designed with more advanced students in mind. Most courses involve class meetings one hour in length, twice a week; but some consist of two weekly one-and-a-half-hour meetings or a single two-hour meeting per week. Some courses are offered exclusively to graduate students.

Students may enroll in as many courses as they desire and are permitted to repeat any course.

COURSES

ACEN - ACADEMIC ENGLISH

Upper-Division

ACEN 110A - Advanced Academic English 1 (5)

Students develop an academic vocabulary and successful reading strategies in English in order to understand high-level academic texts. Students also practice pronunciation and apply the rules of grammar to written and spoken academic language through weekly oral presentations and written assignments. Enrollment by instructor consent only. Enrollment is restricted to international students.

ACEN 110B - Advanced Academic English 2 (5)

Students continue to develop an academic vocabulary (e.g., collocations, idiomatic expressions), which is a significant contributor to successful academic reading and writing. Students also practice complex sentence structures in written and spoken language through weekly oral presentations and written assignments. Enrollment is by instructor consent only. Enrollment is restricted to international students.

ACEN 110C - Advanced Grammar in Context (5)

Students continue to develop an academic vocabulary, and practice reading and writing complex sentences in English with a high level of grammatical and stylistic accuracy. Students also increase their oral fluency and pragmatic skills and their awareness of second-language learning. Enrollment by instructor consent only. Enrollment restricted to international students. (Formerly Advanced Academic English 3.)

ACEN 110D - Advanced Academic English 4 (5)

Students continue to develop an academic vocabulary, and practice reading and writing complex essays in English with a high level of grammatical and stylistic accuracy. Students also continue to increase their oral fluency, pragmatic skills, and awareness of second-language learning. Enrollment is by instructor consent only. Enrollment is restricted to international students.

AM - APPLIED MATHEMATICS

Lower-Division

AM 3 - Precalculus for the Social Sciences (5)

Introduces mathematical functions and their uses for modeling real-life problems in the social sciences. Includes inequalities, linear and quadratic equations, functions (linear, quadratic, polynomial, rational, power, exponential, logarithmic, trigonometric), inverses, and the composition of functions. Students cannot receive credit for both this course and MATH 3. MATH 3 can substitute for this course. (Formerly Applied Mathematics and Statistics 3.)

Prerequisite: Prerequisite(s): score of 200 or higher on the mathematics placement examination (MPE), or MATH 2.

AM 6 - Precalculus for Statistics (5)

Reviews and introduces mathematical methods useful in the elementary study of statistics, including logic, real numbers, inequalities, linear and quadratic equations, functions, graphs, exponential and logarithmic functions, and summation notation. (Formerly AMS 6.)

Prerequisite: Prerequisite(s): MATH 2 or mathematics placement examination (MPE) score of 200 or higher or higher.

AM 10 - Mathematical Methods for Engineers I (5)

Applications-oriented course on complex numbers and linear algebra integrating Matlab as a computational support tool. Introduction to complex algebra. Vectors, bases and transformations, matrix algebra, solutions of linear systems, inverses and determinants, eigenvalues and eigenvectors, and geometric transformations. Students cannot receive credit for this course and for AM 10A or MATH 21. (Formerly AMS 10.)

Prerequisite: Prerequisite(s): score of 400 or higher on the mathematics placement examination (MPE) or MATH 3.

AM 11A - Mathematical Methods for Economists I (5)

Introduction to mathematical tools and reasoning, with applications to economics. Topics are drawn from differential calculus in one variable and include limits, continuity, differentiation, elasticity, Taylor polynomials, and optimization. Students cannot receive credit for both this course and MATH 11A or MATH 19A or AM 15A. (AM 11A formerly AMS 11A.)

Prerequisite: Students who have already taken MATH 11A or MATH 19A should not take this course. Prerequisite(s): score of 300 or higher on the mathematics placement examination (MPE), AM 3 or AM 6, or MATH 3.

AM 11B - Mathematical Methods for Economists II (5)

Mathematical tools and reasoning, with applications to economics. Topics are drawn from multivariable differential calculus and single variable integral calculus, and include partial derivatives, linear and quadratic approximation, optimization with and without constraints, Lagrange multipliers, definite and indefinite integrals, and elementary differential equations. Students cannot receive credit for both this course and MATH 11B or MATH 19B or AM 15B. (AM 11B formerly AMS 11B.)

Prerequisite: Prerequisite(s): ECON 11A, or AM 11A, or MATH 11A, or MATH 19A.

AM 15A - Case-Study Calculus I (5)

Case-study-based, first-quarter introduction to single-variable calculus, with computing labs/discussion sections featuring contemporary symbolic, numerical, and graphical computing

tools. Case studies drawn from biology, environmental sciences, health sciences, and psychology. Includes functions, mathematical modeling, limits, continuity, tangents, velocity, derivatives, the chain rule, implicit differentiation, higher derivatives, exponential and logarithmic functions and their derivatives, differentiating inverse functions, the mean value theorem, concavity, inflection points, function optimization, and curve-sketching. Students cannot receive credit for this course and AM 11A or ECON 11A or MATH 11A or MATH 19A. (Formerly AMS 15A.)

Prerequisite: Prerequisite(s): AM 3 or MATH 3 or score of 300 or higher on the mathematics placement examination (MPE) or by permission of instructor.

AM 15B - Case-Study Calculus II (5)

Case-study based, second-quarter introduction to single-variable calculus, with computing labs/discussion sections featuring symbolic numerical, and graphical computing tools. Case studies are drawn from biology, environmental science, health science, and psychology. Includes indefinite and definite integrals of functions of a single variable; the fundamental theorem of calculus; integration by parts and other techniques for evaluating integrals; infinite series; Taylor series, polynomial approximations. Students cannot receive credit for this course and AM 11B or ECON 11B or MATH 11B or MATH 19B. (Formerly AMS 15B.)

Prerequisite: Prerequisite(s): AM 15A or AM 11A or ECON 11A or MATH 11A or MATH 19A.

AM 20 - Mathematical Methods for Engineers II (5)

Applications-oriented class on ordinary differential equations (ODEs) and systems of ODEs using Matlab as a computational support tool. Covers linear ODEs and systems of linear ODEs; nonlinear ODEs using substitution and Laplace transforms; phase-plane analysis; introduction to numerical methods. Students cannot receive credit for this course and for AM 20A or MATH 24. (Formerly AMS 20.)

Prerequisite: Prerequisite(s): MATH 19B, and AM 10 or MATH 21.

AM 30 - Multivariate Calculus for Engineers (5)

Advanced multivariate calculus for engineering majors. Coordinate systems, parametric curves, and surfaces; partial derivatives, gradient, Taylor expansion, stationary points, constrained optimization; integrals in multiple dimensions; integrals over curves and surfaces. Applications to engineering form an integral part of the course.

Prerequisite: Prerequisite(s): AM 10; and MATH 19B or MATH 20B.

Upper-Division

AM 100 - Mathematical Methods for Engineers (5)

Covers important concepts in applied mathematics, including complex analysis, vector calculus, Fourier Series, and integral transforms. Applications of the methods to various problems in science and engineering are discussed.

Prerequisite: Prerequisite(s): AM 20 and AM 30, or by permission of instructor.

AM 107 - Introduction to Fluid Dynamics (5)

Covers fundamental topics in fluid dynamics: Euler and Lagrange descriptions of continuum dynamics; conservation laws for inviscid and viscous flows; potential flows; exact solutions of the Navier-Stokes equation; boundary layer theory; gravity waves. Students cannot receive credit for this course and AM 217. (AM 107 formerly AMS 107.)

Prerequisite: Prerequisite(s): AM 112 or MATH 107 or PHYS 116C or EART 111.

AM 112 - Introduction to Partial Differential Equations (5)

Focuses on analytical methods for partial differential equations (PDEs) of two variables, including: the method of characteristics for first-order PDEs; classification of second-order PDEs; separation of variables; Sturm-Liouville theory; and Green's functions. Illustrates each method using applications taken from examples in physics. Students cannot receive credit for this course and AM 212A.

Prerequisite: Prerequisite(s): AM 100 or by permission of the instructor. Enrollment is restricted to juniors and seniors.

AM 114 - Introduction to Dynamical Systems (5)

Introduces continuous and discrete dynamical systems. Topics include: fixed points; stability; limit cycles; bifurcations; transition to and characterization of chaos; fractals. Examples are drawn from sciences and engineering. Students cannot receive credit for this course and AM 214 or MATH 145. (Formerly AMS 114.)

Prerequisite: Prerequisite(s): AM 20; or MATH 21 and MATH 24; or PHYS 116A. Enrollment is restricted to sophomores, juniors and seniors.

AM 115 - Stochastic Modeling in Biology (5)

Application of differential equations, probability, and stochastic processes to problems in cell, organismal, and population biology. Topics include systems biology, cellular processes, gene-regulation, and population biology. Students may not receive credit for this course and AM 215.

Prerequisite: Prerequisite(s): STAT 131 and AM 20; a university-level course in biology, and operational knowledge of a programming language; or consent of instructor.

AM 129 - Foundations of Scientific Computing for Scientists and Engineers (5)

Covers fundamental aspects of scientific computing for research. Students are introduced to algorithmic development, programming (including the use of compilers, libraries, debugging, optimization, code publication), computational infrastructure, and data analysis tools, gaining hands-on experience through practical assignments. Basic programming experience is assumed.

Prerequisite: Prerequisite(s): AM 10 and MATH 11A; or AM 10 and MATH 19A; or AM 10 and MATH 20A; or MATH 21

and MATH 11A; or MATH 21 and MATH 19A; or MATH 21 and MATH 20A.

AM 147 - Computational Methods and Applications (5)

Applications of computational methods to solving mathematical problems using Matlab. Topics include solution of nonlinear equations, linear systems, differential equations, sparse matrix solver, and eigenvalue problems. Students cannot receive credit for this course and MATH 148. (Formerly AMS 147.)

AM 148 - GPU Programming for Scientific Computations (5)

This second course in scientific computing focuses on the use of parallel processing on GPUs with CUDA. Basic topics covered include the idea of parallelism and parallel architectures. The course then presents key parallel algorithms on GPUs such as scan, reduce, histogram and stencil, and compound algorithms. Applications to scientific computing are drawn from problems in linear algebra, curve fitting, FFTs, systems of ODEs and PDEs, and image processing. Finally, the course presents optimization strategies specific to GPUs. Basic knowledge of Unix, and C is assumed. (Formerly AMS 148.)

Prerequisite: Prerequisite(s): AM 147 or MATH 148 or PHYS 115. Enrollment is restricted to juniors and seniors.

AM 170A - Mathematical Modeling 1 (5)

Introduction to mathematical modeling emphasizing model construction, tool selection, methods of solution, critical analysis of the results, and professional-level presentation of the results (written and oral). Focuses on problems that can be solved using only analytical tools, and simple Matlab routines. Applications are drawn from a variety of fields such as physics, biology, engineering, and economics.

Prerequisite: Prerequisite(s): Satisfaction of the ELWR requirements. AM 30, and AM 114 or AM 214, and STAT 131 or CSE 107, or by permission of the instructor. Enrollment is restricted to juniors and seniors; graduate students may apply by permission.

AM 170B - Mathematical Modeling 2 (5)

Second course in mathematical modeling emphasizing the general process of scientific inquiry: model construction, tool selection, numerical methods of solution, critical analysis of the results, and professional-level presentation of the results (written and oral). Focuses on problems that must be solved using numerical tools. Applications are drawn from a variety of fields.

Prerequisite: Prerequisites: AM 129 or AM 209, AM 147, and AM 170A. AM 170A may be taken concurrently with AM 170B on an exceptional basis by permission of the instructor. Enrollment is restricted to seniors. Graduate students may apply with permission of the instructor.

AM 198 - Independent Study or Research (5)

Students submit petition to sponsoring agency.

AM 198F - Independent Study or Research (2)

Students submit petition to sponsoring agency.

Graduate

AM 200 - Research and Teaching in Applied Mathematics (3)

Basic teaching techniques for teaching assistants, including responsibilities and rights; resource materials; computer skills; leading discussions or lab sessions; presentation techniques; maintaining class records; and grading. Examines research and professional training, including use of library; technical writing; giving talks in seminars and conferences; and ethical issues in science and engineering. (Formerly AMS 200.)

Prerequisite: Enrollment is restricted to graduate students.

AM 211 - Foundations of Applied Mathematics (5)

Accelerated class reviewing fundamental applied mathematical methods for all sciences. Topics include: multivariate calculus, linear algebra, Fourier series and integral transform methods, complex analysis, and ordinary differential equations. (Formerly AMS 211.)

Prerequisite: Enrollment is restricted to graduate students.

AM 212A - Applied Partial Differential Equations (5)

Focuses on analytical methods for partial differential equations (PDEs), including: the method of characteristics for first-order PDEs; canonical forms of linear second-order PDEs; separation of variables; Sturm-Liouville theory; Green's functions. Illustrates each method using applications taken from examples in physics. AM 211 or equivalent is strongly recommended as preparation. Students cannot receive credit for this course and AM 112. (Formerly AMS 211, Applied Mathematical Methods I.)

AM 212B - Applied Mathematical Methods II (5)

Covers perturbation methods: asymptotic series, stationary phase and expansion of integrals, matched asymptotic expansions, multiple scales and the WKB method, Pad approximants and improvements of series. (Formerly AMS 212B.)

Prerequisite: Prerequisite(s): Enrollment is restricted to graduate students. Undergraduates may enroll by permission of the instructor.

AM 213A - Numerical Linear Algebra (5)

Focuses on numerical solutions to classic problems of linear algebra. Topics include: LU, Cholesky, and QR factorizations; iterative methods for linear equations; least square, power methods, and QR algorithms for eigenvalue problems; and conditioning and stability of numerical algorithms. Provides hands-on experience in implementing numerical algorithms for solving engineering and scientific problems. Basic knowledge of mathematical linear algebra is assumed. (Formerly AMS 213A.)

Prerequisite: Enrollment is restricted to graduate students. Undergraduate students may enroll with permission of the instructor.

AM 213B - Numerical Methods for the Solution of Differential

Equations (5)

Introduces the numerical solutions of ordinary and partial differential equations (ODEs and PDEs). Focuses on the derivation of discrete solution methods for a variety of differential equations, and their stability and convergence. Also provides hands-on experience in implementing such numerical algorithms for the solution of engineering and scientific problems using MATLAB software. The class consists of lectures and hands-on programming sections. Basic mathematical knowledge of ODEs and PDEs is assumed, and a basic working knowledge of programming in MATLAB is expected. (Formerly AMS 213B.)

Prerequisite: Enrollment is restricted to graduate students.

AM 214 - Applied Dynamical Systems (5)

Introduces continuous and discrete dynamical systems. Topics include: fixed points; stability; limit cycles; bifurcations; transition to and characterization of chaos; and fractals. Examples drawn from sciences and engineering; founding papers of the subject are studied. Students cannot receive credit for this course and AM 114 or MATH 145. (Formerly AMS 214.)

AM 215 - Stochastic Modeling in Biology (5)

Application of differential equations, probability, and stochastic processes to problems in cell, organismal, and population biology. Topics include systems biology, cellular processes, gene-regulation, and population biology. Students may not receive credit for this course and AM 115. (Formerly AMS 215.)

Prerequisite: Enrollment is restricted to graduate students; undergraduates may enroll by permission of the instructor.

AM 216 - Stochastic Differential Equations (5)

Introduction to stochastic differential equations and diffusion processes with applications to biology, biomolecular engineering, and chemical kinetics. Topics include Brownian motion and white noise, gambler's ruin, backward and forward equations, and the theory of boundary conditions. (Formerly AMS 216.)

Prerequisite: Enrollment is restricted to graduate students; undergraduates may enroll by permission of the instructor.

AM 217 - Introduction to Fluid Dynamics (5)

Covers fundamental topics in fluid dynamics at the graduate level: Euler and Lagrange descriptions of continuum dynamics; conservation laws for inviscid and viscous flows; potential flows; exact solutions of the Navier-Stokes equation; boundary layer theory; gravity waves. Students cannot receive credit for this course and AM 107. (Formerly AMS 217.)

Prerequisite: Enrollment is restricted to graduate students; undergraduates may enroll by permission of the instructor.

AM 227 - Waves, Instabilities, and Turbulence in Fluids (5)

Advanced fluid dynamics course introducing various types waves and instabilities that commonly arise in geophysical and

astrophysical systems, as well as turbulence. Topics covered include, but are not limited to: pressure waves, gravity waves, convection, shear instabilities, and turbulence. Advanced mathematical methods are used to study each topic. Undergraduates are encouraged to take this course with permission of the instructor. (Formerly Waves and Instabilities in Fluids.)

Prerequisite: Prerequisite(s): AM 212A and AM 217.

AM 229 - Convex Optimization (5)

Focuses on recognizing, formulating, analyzing, and solving convex optimization problems encountered across science and engineering. Topics include: convex sets; convex functions; convex optimization problems; duality; subgradient calculus; algorithms for smooth and non-smooth convex optimization; applications to signal and image processing, machine learning, statistics, control, robotics and economics. Students are required to have knowledge of calculus and linear algebra, and exposure to probability. (Formerly AMS 229.)

Prerequisite: Enrollment is restricted to graduate students.

AM 230 - Numerical Optimization (5)

Introduces numerical optimization tools widely used in engineering, science, and economics. Topics include: line-search and trust-region methods for unconstrained optimization, fundamental theory of constrained optimization, simplex and interior-point methods for linear programming, and computational algorithms for nonlinear programming. (Formerly AMS 230.)

AM 231 - Nonlinear Control Theory (5)

Covers analysis and design of nonlinear control systems using Lyapunov theory and geometric methods. Includes properties of solutions of nonlinear systems, Lyapunov stability analysis, effects of perturbations, controllability, observability, feedback linearization, and nonlinear control design tools for stabilization. (Formerly AMS 231.)

Prerequisite: Prerequisite(s): basic knowledge of mathematical analysis and ordinary differential equations is assumed. Enrollment is restricted to graduate students; undergraduates may enroll by permission of the instructor.

AM 232 - Applied Optimal Control (5)

Introduces optimal control theory and computational optimal control algorithms. Topics include: calculus of variations, minimum principle, dynamic programming, HJB equation, linear-quadratic regulator, direct and indirect computational methods, and engineering application of optimal control. (Formerly AMS 232.)

Prerequisite: Prerequisite(s): AM 114 or AM 214, or ECE 240 or ECE 241, or MATH 145. Enrollment is restricted to graduate students. Undergraduates may enroll by permission of the instructor.

AM 238 - Fundamentals of Uncertainty Quantification in

Computational Science and Engineering (5)

Computing the statistical properties of nonlinear random system is of fundamental importance in many areas of science and engineering. Introduces students to state-of-the-art methods for uncertainty propagation and quantification in model-based computations, focusing on the computational and algorithmic features of these methods most useful in dealing with systems specified in terms of stochastic ordinary and partial differential equations. Topics include: polynomial chaos methods (gPC and ME-gPC), probabilistic collocation methods (PCM and ME-PCM), Monte-Carlo methods (MC, quasi-MC, multi-level MC), sparse grids (SG), probability density function methods, and techniques for dimensional reduction. Basic knowledge of probability theory and elementary numerical methods for ODEs and PDEs is recommended. (Formerly AMS 238.)

Prerequisite: Prerequisite(s): STAT 203 or equivalent, and AM 213B or equivalent. Enrollment is restricted to graduate students.

AM 250 - An Introduction to High Performance Computing (5)

Designed for STEM students and others. Through hands-on practice, this course introduces high-performance parallel computing, including the concepts of multiprocessor machines and parallel computation, and the hardware and software tools associated with them. Students become familiar with parallel concepts and the use of MPI and OpenMP together with some insight into the use of heterogeneous architectures (CPU, CUDA, OpenCL), and some case-study problems. (Formerly AMS 250.)

Prerequisite: Enrollment is restricted to graduate students; undergraduates may enroll by permission of the instructor.

AM 260 - Computational Fluid Dynamics (5)

Introduces modern computational approaches to solving the differential equations that arise in fluid dynamics, particularly for problems involving discontinuities and shock waves. Examines the fundamentals of the mathematical foundations and computation methods to obtain solutions. Focuses on writing practical numerical codes and analyzing their results for a full understanding of fluid phenomena. (Formerly AMS 260.)

Prerequisite: Prerequisite(s): Basic knowledge of computer programming languages is assumed. Enrollment is restricted to graduate students.

AM 275 - Magnetohydrodynamics (5)

Studies the interaction of fluid motion and magnetic fields in electrically conducting fluids, with applications in many natural and man-made flows ranging from, for example, planetary physics and astrophysics to industrial metallurgic engineering. (Formerly AMS 275.)

Prerequisite: Prerequisite(s): AM 107 or AM 217. AM 227 suggested. Enrollment is restricted to graduate students.

AM 280A - Seminar in Mathematical and Computational Biology

(2)

Weekly seminar on mathematical and computational biology. Participants present research findings in organized and critical fashion, framed in context of current literature. Students present own research on a regular basis. (Formerly AMS 280A.)

Prerequisite: Enrollment is restricted to graduate students.

AM 280B - Seminar in Applied Mathematical Modeling (2)

Weekly seminar series covering topics of current research in applied mathematics and statistics. Permission of instructor required. Enrollment is restricted to graduate students. (Formerly AMS 280B.)

AM 280C - Seminar in Geophysical and Astrophysical Fluid Dynamics (2)

Weekly seminar/discussion group on geophysical and astrophysical fluid dynamics covering both analytical and computational approaches. Participants present research progress and findings in semiformal discussions. Students must present their own research on a regular basis. (Formerly AMS 280C.)

Prerequisite: Enrollment is restricted to graduate students; undergraduates may enroll by permission of the instructor.

AM 296 - Masters Project (2)

Independent completion of a masters project under faculty supervision. Students submit petition to sponsoring agency. Enrollment is restricted to graduate students.

AM 297A - Independent Study or Research (5)

Independent study or research under faculty supervision. Students submit petition to sponsoring agency. Enrollment is restricted to graduate students.

AM 297B - Independent Study or Research (10)

Independent study or research under faculty supervision. Students submit petition to sponsoring agency. Enrollment is restricted to graduate students.

AM 297C - Independent Study or Research (15)

Independent study or research under faculty supervision. Students submit petition to sponsoring agency. Enrollment is restricted to graduate students.

AM 297F - Independent Study (2)

Independent study or research under faculty supervision. Students submit petition to sponsoring agency. Enrollment is restricted to graduate students.

AM 299A - Thesis Research (5)

Thesis research under faculty supervision. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

AM 299B - Thesis Research (10)

Thesis research under faculty supervision. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

AM 299C - Thesis Research (15)

Thesis research under faculty supervision. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

ANTH - ANTHROPOLOGY**Lower-Division****ANTH 1 - Introduction to Biological Anthropology (5)**

Study of evolution illustrated by Pleistocene hominid fossils and variation in living human groups. Behavior and evolution of primates examined as they contribute to the understanding of human evolution. Required for all anthropology majors. (Formerly Introduction to Human Evolution.)

ANTH 2 - Introduction to Cultural Anthropology (5)

A number of different peoples are studied and a variety of approaches to the nature of the culture and to the study of specific cultures presented. Required for all anthropology majors.

ANTH 3 - Introduction to Archaeology (5)

Overview of ways of learning about the human past beyond the scope of written history. Reviews development of archaeology, fundamental methods and theories, and archaeology's contribution to understanding human origins, the emergence of farming, and the origins of complex societies.

ANTH 93 - Field Study (5)

Supervised research or organized projects on anthropological topics for lower-division students. Conducted either on or off campus. Students submit petition to sponsoring agency.

ANTH 97 - Laboratory Safety Practicum (2)

Covers laboratory health and safety and standard operating procedures within the anthropology laboratories. Prepares students for future laboratory research activities while providing support of laboratory administration, collections management, and laboratory course demonstration needs. Enrollment by application.

Upper-Division**ANTH 100 - History and Theory of Biological Anthropology (5)**

Provides an historical overview from the 18th century to the present of race, ape-human relationships, and human nature. Emergence of an evolutionary framework and of fossil, genetic, and primate information becomes the basis for reformulating ideas about human biology within anthropology.

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3 and satisfaction of the Entry Level Writing and Composition requirements.

ANTH 101 - Human Evolution (5)

Study of human evolution covering the last five million years. Examines the fossil evidence and emphasizes the reconstruction of behavior from the paleontological and anatomical evidence.

Prerequisite: Prerequisite(s): ANTH 1.

ANTH 102A - Human Skeletal Biology (5)

Presents basic human osteology allowing students to identify skeletal material by element. Emphasizes the dynamic nature of bone by integrating anatomy with a discussion of bone physiology within the context of the human life cycle.

Prerequisite: Prerequisite(s): ANTH 1.

ANTH 103 - Forensic Anthropology (5)

Covers the basic analysis of human skeletal remains for the medicolegal profession. Assessment of age, sex, ancestry, and general physical characteristics, trauma, and disease are discussed. Addresses the legal responsibilities of the anthropologist. Online lectures with in-class discussion sections, quizzes, and exams. Students cannot receive credit for this course and ANTH 103I.

Prerequisite: Prerequisite(s): ANTH 102A. Enrollment is restricted to juniors and seniors.

ANTH 103I - Forensic Anthropology (4)

This online course teaches the basic analysis of human remains for the medico-legal profession. Covers the development of forensic anthropology, creating a biological profile, evaluating skeletal trauma, estimation of interval since death, and how these assessments can be supported. Students cannot receive credit for this course and for ANTH 103.

Prerequisite: Prerequisite(s): ANTH 102A.

ANTH 104 - Human Variation and Adaptation (5)

Explores the major environmental factors (temperature, altitude, diet, and disease); how they are perceived by the human body; the physiological, micro- and macroanatomical responses; and how behavior and culture can modify the impact of these stresses. ANTH 1 is highly recommended as preparation. (Formerly Human Adaptability.)

ANTH 105 - Human Paleopathology (5)

Examines paleopathology beginning with ancient hominid populations and proceeding to modern populations. Uses both the skeletal evidence and historical documentation when available. Considers evolutionary, cultural, and biological factors. Topics include: osteological diagnosis of infectious disease; trauma; nutritional deficiencies; dental disease; and developmental defects.

Prerequisite: Prerequisite(s): ANTH 1; ANTH 102A recommended.

ANTH 106 - Primate Behavior and Ecology (5)

The nature of primate social systems and social bonds is examined in the light of evolutionary and ecological concepts. We explore the evolution of primate social system behavior and culture, as well as the ecologies of primate populations.

Prerequisite: Prerequisite(s): ANTH 1.

ANTH 107A - Methods and Research in Biological Anthropology: Genetics (5)

Introduces the molecular analyses of anthropological questions and explores the intersection of genetics and anthropology. Covers the basic principles of molecular and population genetics as they relate to the study of humans. Prerequisite(s): ANTH 1 and ANTH 104. ANTH 102A is recommended. Enrollment by permission of instructor. (Formerly ANTH 107, Methods and Research in Molecular Anthropology.)

ANTH 107B - Methods and Research in Biological Anthropology: Stable Isotopes (5)

This combination of lectures, readings, discussions, and hands-on laboratory experience provides a comprehensive overview of stable isotope research to reconstruct diet and mobility. Discover the wide application of isotopic research in biological anthropology, bioarcheology, primatology and forensics. Prerequisite(s): at least one of ANTH 101, ANTH 104, ANTH 106, ANTH 107, or ANTH 110F and by permission of the instructor. (Formerly Methods and Research in Stable Isotope Ecology.)

Prerequisite: Prerequisite(s): ANTH 101 or ANTH 104 or ANTH 106 or ANTH 107 or ANTH 110F.

ANTH 107C - Methods and Research in Biological Anthropology: Chimpanzee Behavior and Culture (5)

Lab class analyzing trail camera footage from chimpanzees and other wildlife, and installing our own cameras in the UCSC forest. Also includes readings and discussion of papers related to the newest findings on chimpanzee behavioral diversity and culture. Prerequisite(s): ANTH 106. Enrollment is by instructor consent.

ANTH 107D - Methods and Research in Biological Anthropology--Computational Population Genetics (5)

Practical introduction to computational population genetics. Covers the basic principles of population and evolutionary genetics, and explores those with a range of computational methods for the analysis of genetic diversity, population structure, and admixture. Enrollment is by instructor consent.

ANTH 109 - Evolution of Sex (5)

Provides a physical anthropology understanding of the evolution of sex. Focuses on genetics and the alterations in allele associations that take place as a result of sexual processes.

Prerequisite: Prerequisite(s): ANTH 1.

ANTH 110A - Public Life and Contemporary Issues (5)

How can cultural anthropology help us to understand current events unfolding locally, nationally, and globally? Students learn how to read newspapers differently--that is, through the lens of cultural analysis. The world of everyday politics and society, as it unfolds in debates happening right now, forms the topical substance of the course.

ANTH 110B - From Indiana Jones to Stonehenge: Archaeology as Popular Culture (5)

Addresses the meaning of archaeology as generated in television, movies, literature, newspapers, and even National Geographic. Students engage with several case-studies illustrating how archaeology is portrayed in popular culture.

ANTH 110C - California Pasts (5)

This course is structured around four critical moments--missionization, Rancho-Era, Gold Rush, and World War II--through the eyes of the ethnic and racial minorities who experienced them. Special attention is given to oral, archival, and archaeological sources which reveal California's multiethnic pasts.

ANTH 110D - Tourism Imaginaries and Encounters (5)

Explores anthropological approaches to the study of tourism, in particular themes of authenticity, othering, visual economies, development, identity politics, alternative tourisms, and material culture with reference to history, power, and location.

ANTH 110E - Anthropology of Global Environmental Change (5)

Introduces anthropological and historical approaches to environmental change and globalization. Key themes include: capitalism and industrialization, environmental politics, global culture, and relations between humans and other species.

ANTH 110F - Evolution of Human Diet (5)

Presents the evolution of human diet and subsistence from a biological anthropological perspective. Covers the key hypothesis and methodologies related to diet, from our early fossil ancestors up to agriculture and animal husbandry. (Formerly Biocultural Approaches to Food.)

ANTH 110G - Westside Stories: Race, Place and the California Imaginary (5)

From South Central to La Misi3n, this course explores the role of race and culture in creating the California Dream. Draws on films, music, and activism as lenses into the complex flows of power that shape our communities.

ANTH 110H - Brazilian Amazon Cultures and Environments (5)

General introduction to the astonishing diversity of cultures and environments in the Brazilian Amazon. Designed to provide upfront understanding of what underlies perverse (non)development and forest destruction, but also social defense of the forest and sustainable life within it.

ANTH 110I - Cultures of Sustainability and Social Justice (5)

Brings together diverse forms of cultural knowledge and complexities of everyday life to illuminate longstanding concerns of sustainability and justice. Investigates multiple theories of sustainable development as well as tools, techniques, and contexts for ecological integrity, economic security, empowerment, responsibility and social well-being characteristic of sustainable communities. Case studies are drawn from around the world highlighting the work of Right Livelihood Award Laureates in tandem with UC faculty.

ANTH 110J - Emerging Humanity (5)

Using an anthropological and archaeological perspective to learn about human history before AD 1500, course explores fossil remains of human ancestors and traces the more recent history of humanity from forgers/hunters to the emergence of complex societies/civilizations. Topics include human biological evolution, the development of organized human societies, the origins of food production (domestication of plants and animals), the origins of the world's earliest urban centers, and the development of social inequality.

ANTH 110K - Culture Through Food (5)

Examines anthropology of food and politics of eating. Cultural and social uses of food in rituals of solidarity or fasting, identities and meanings of food for individuals, and consumption in the global context are key components of study.

ANTH 110L - The Human Ocean (5)

From coral reefs to Arctic sea ice, this course examines how humans interact with and transform earth's oceans, and how humans are shaped by the sea. Topics include: marine conservation, migration, shipping and logistics, slavery, fisheries management, and climate change.

ANTH 110N - Anthropology of Food (5)

Focuses on social institutions around the world that shape food and its meanings; how people use food to organize their worlds; and production, sharing, or consumption of food as a political or meaningful act.

ANTH 110O - Postcolonial Britain and France (5)

Transdisciplinary examination of the politics and culture of postcolonial Britain and France. Topics include: immigration from South Asia, Africa, and the Caribbean; racism and antiracism; minority difference and citizenship practices; and the emergence of Islam as a major category of identity and difference.

ANTH 110P - India and Indian Diaspora through Film (5)

Explores several themes of relevance in contemporary India and Indian diaspora, concentrating on anthropological research and various documentary and popular Bollywood films. Through films and ethnographies, students analyze the nature of anthropological contributions to the study of Indian societies. (Formerly course 80P.)

ANTH 110Q - Queer Sexuality in Black Popular Culture (5)

From Janet Mock to Young M.A., queerness has become hypervisible in Black popular culture--but at what cost? Using music, television, and social media as central texts, students investigate the intersections of sexuality, gender, and race in public life.

ANTH 110R - Discourses in American Religions and Their Role in Public Life (5)

Introduces dominant discourses about major American religions and their role in public life, with particular attention to intersecting differences, such as race, sex/gender, and disability, and to shifting religious/political boundaries. Visual and textual media, political commentary, and popular ethnographies are analyzed.

ANTH 110S - Evolution of Democracy (5)

Examines the state and its institutions from a historical, social, and cross-cultural perspective, paying attention to the varied discourses and practices that constitute what we call the state.

ANTH 110T - Motherhood in American Culture (5)

Examines the culture wars around motherhood in the United States with a focus on the political mobilization of normative ideas about the correct way to mother, from the moment of conception on. Special attention is given to the historical construction of deviant motherhood among marginalized groups.

ANTH 110U - Histories and Cultures of Piracy (5)

An interdisciplinary yet anthropologically informed approach to studying pirates and piracy across different historical eras and spaces. Explores the role of pirates in world history from ancient to present times, including piracy both at sea and online.

ANTH 110V - American Capitalism (5)

Capitalism shapes our lives in unequal ways, but what is it? Course explores histories and machinations of capitalism in the Americas, focusing on the United States. Investigates what capitalism is, how it operates, its origins, and what might come next.

ANTH 110W - Land and Waterscapes Entropology (5)

Establishes anthropological interconnections of emergent worlds where environmental matters, social justice, and human survival interrelate. Focuses on anti-essential nature and waterscape ethnographies in which different pluricultures revalidate local understandings as ways of contesting increasing forms of land and water privatization.

ANTH 110Y - Feeding California (5)

Online course introducing students to social practices, political processes, and cultural contexts that shape food production and consumption. Considers identity, heritage, choice, power, agency, body practices, belonging, access, safety, and security. Prioritizes California case studies, with comparative examples from around the world.

ANTH 111 - Human Ecology (5)

Reviews the environmental, physiological, behavioral, and cultural ways that humans interact with their physical surroundings. The effects of human culture on the environment and of the environment on the shape of human culture is emphasized.

ANTH 112 - Life Cycles (5)

Examines the human life cycle using an evolutionary framework. Examines key aspects of the human life stages using findings and concepts from developmental biology, physiology, nutrition, evolutionary ecology, and life-history theory.

Prerequisite: Prerequisite(s): ANTH 1.

ANTH 113 - Tutoring Writing in Anthropology (2)

Trains students to tutor writing in undergraduate anthropology courses; supports and guides them during the quarter they are tutoring. Enrollment by interview only. Prerequisite(s): satisfaction of the Composition requirement.

ANTH 119 - Indigenous Visual Culture (5)

Examines the relationship between visual cultures and indigenous peoples. First, class discusses what is visual anthropology. Second, class examines the relationship between museums and indigenous peoples. Third, class examines ethnographic photography and indigenous uses of photography. Fourth, class examines the uses of ethnographic film, and then its relationship to indigenous peoples. Finally, class examines indigenous uses of film.

ANTH 121 - Socialism (5)

Ethnography-based course that examines the social worlds of socialism, with particular focus on state socialism. Topics include: social problems that inspired socialist movements; implementation and experience of socialism in daily life; and significance of class, race, nation, science, technology, rationality.

ANTH 122 - Postsocialism (5)

Examines the demise of socialist systems. Addresses the political, social, cultural, and economic experiences of everyday life that led to that demise, what new social inequalities have arisen since, and how citizens use the socialist past to critique the present.

ANTH 123 - Psychological Anthropology (5)

An introduction to some of the central theoretical issues in psychological anthropology. Psychoanalytic, cognitive, and relativist perspectives on the link between person and society are discussed and compared.

Prerequisite: Prerequisite(s): ANTH 2.

ANTH 124 - Anthropology of Religion (5)

Study of the phenomenon of religion as manifested in ethnographic literature, with special attention to traditional and

recent modes of analysis of religious behavior. Special topics include myth, religious healing, witchcraft and sorcery, ritual, and millenarian movements.

ANTH 125 - Magic, Science, and Religion (5)

With a theoretical understanding of the concepts of magic, science, and religion, students draw on ethnographies of these practices to critique distinctions between them and critically analyze the understanding of these categories and their relation in the modern world

ANTH 126 - Contraband: Shadow Economies and the Law (5)

Course takes an interdisciplinary approach to studying contraband and smuggling. Focusing on concepts used to describe illegality we examine how "shadow economies" are central to the making of states and sovereignty, the legal and illegal being blurred.

ANTH 127 - Ethnographies of Capitalism (5)

Challenges approaches to capitalism that treat it as socioeconomic relations separable from culture. Readings include ethnographies demonstrating the inextricability of cultural meanings from capitalist practices. Topics include capitalism's relationship to colonialism, nationalism, socialism, gender, and the commodification of aesthetics.

ANTH 128 - Contemporary American Evangelical Cultures (5)

Study of contemporary, American, born-again Protestant discourse using ethnographic materials and interpretive theories. Topics include biblical literalism, Christian conversion and self-fabulation, charismatic gifts, preaching, sacrificial giving, prosperity theology, apocalypticism, creationism, pro-family and pro-life rhetoric, and televangelism. (Formerly *Born-Again Religion and Culture*.)

ANTH 129 - Beyond Borders: Other Globalizations and Histories of Interconnection (5)

The history of social and cultural interconnections at a global scale. Anthropological approaches to the study of cultural encounter are used to investigate topics such as trade, religion, and citizenship and to evaluate shifting concepts of civilization and barbarism. (Formerly *Other Globalizations: Cultures and Histories of Interconnection*.)

Prerequisite: Prerequisite(s): ANTH 2.

ANTH 130A - Anthropology of Africa. (5)

Survey of sub-Saharan societies. Analysis of principles of social organization and factors of cultural unity of selected western, eastern, central, and southern African peoples. (Formerly *Peoples and Cultures of Africa*)

ANTH 130B - Brazil (5)

Examines Brazilian culture and its link to interpersonal relationships, religion, politics, and psychological experience.

Prerequisite: Prerequisite(s): ANTH 2.

ANTH 130C - Politics and Culture in China (5)

Joins substantive information about Chinese society and culture with debates in social theory and rethinks conventional wisdom about colonialism and modernity. Topics include representations of Chineseness, class revolution, Chinese diaspora, popular culture, family and kinship, nationalism, history/memory, race and gender.

ANTH 130E - Culture and Politics of Island Southeast Asia (5)

Southeast Asia includes a variety of societies exhibiting many ecological adaptations, religions, marriage systems, and experiences with colonial powers. Case studies of particular societies, chosen to reveal variety, are examined comparatively. Emphasis on religion and social organization.

Prerequisite: Prerequisite(s): ANTH 2.

ANTH 130F - Blackness In Motion: Anthology of the African Diasporas (5)

What connects Black communities in the Caribbean, the U.S., Latin America, and Canada, and what sets them apart? Examines theories of diaspora, gender and sexuality, slavery, colorism, music, U.S. hegemonies, social movements, and comparative racialization and global anti-blackness (Formerly African Diasporas in the Americas.)

ANTH 130G - Asian Americans in Ethnography and Film (5)

Critically examines category of Asian Americans. Addresses historic representations of Asians and Asian Americans in ethnographic research and film. Explores contemporary issues of race, culture, and politics through ethnographic practice and cultural production.

ANTH 130H - Ethnography of Russia and Eastern Europe (5)

Introduces students to the ethnography of Eurasia, with special attention to the lived experience and legacy of state socialism in this region. Topics include new ideas of personhood, changing economic practices, public health, and international development.

ANTH 130I - Cultures of India (5)

An examination of anthropological studies of tribal, rural, and urban cultures of India and a look at changes taking place in India.

ANTH 130J - Politics and Statemaking in Latin America (5)

Introduction to ethnohistory and political anthropology of one or more Latin American countries: Typically Mexico and one other country. Students explore how contested concepts such as indigeneity, nation or state come to gain credibility and are deployed in contemporary politics.

ANTH 130L - Ethnographies of Latin America (5)

A broad introduction to issues and areas of cultural production and transformation in the Caribbean, Mexico, and Central and South America. Colonial, neocolonial, class, ethnic, gender, religious, ecological, and political relations intersect as represented in ethnographies and film.

Prerequisite: Prerequisite(s): ANTH 2.

ANTH 130M - Inside Mexico (5)

Examines various communities within the Republic of Mexico as represented in ethnographic texts and other forms of cultural production, particularly music and dance. Emphasis on the interplay between the concept of regionalism and national identity. Previous course work in Mexican culture and/or history strongly recommended. Some reading in Spanish is required.

ANTH 130N - Native Peoples of North America (5)

A survey of Native American cultures and experience during the past century, with emphasis on Pueblo cultures of the American Southwest.

ANTH 130O - Native Feminisms, Gender, and Settler Colonialism (5)

Covers Native feminisms, gender, settler colonialism, and ethnography. Students read ethnographies that intervene in Native feminisms and its possibilities. Focuses on ethnographies in the U.S., including Native men and masculinities in Hawaii.

ANTH 130P - Ethnography of Southern Cone Chile and Argentina (5)

Chile and Argentina, although both established within Spanish colonization and physically close, have dissimilar histories and culture. We explore areas of friction and overlap that shaped different peoples, institutions, cultural identities, and histories in countries that share a particular history.

ANTH 130S - Ethnography of Russia and Eastern Europe, Abroad (5)

This study abroad introduces the ethnography of Russia and Eastern Europe, with special attention to lived experience and legacy of state socialism. Topics: effects of socialism, changing economic practices; constructions of new identities; modernization/development; belief systems; and memory and history.

ANTH 130T - Religion and Politics in the Muslim World (5)

Analyzes post-colonial forms of Islam, with particular attention to Muslim societies and cultures in the Middle East, North Africa, and Europe. Emphasizes the relationship between power, knowledge, and representation in anthropological approaches to Islam and Muslims. (Formerly Anthropological Approaches to Islam.)

ANTH 130U - Central America (5)

Draws on political, economic, and anthropological perspectives to analyze the key role of transnationalism and neoliberalism in contemporary Central America. Key topics include: the aftermath of revolutions; labor and gender; indigenous movements and multiculturalism; and transnational migration and governance.

ANTH 130V - Ethnography of Russia (5)

Examines daily life in Russia and affiliated formerly Soviet Republics through historical and cultural comparison. Topics include: socialist and postsocialist daily life; 20th- and 21st-century Russian empire building; cultural politics; economic systems; state-citizen relations; citizenship regimes; labor and leisure; and religion.

ANTH 130W - Ethnography of Eastern Europe (5)

Examines daily life in Eastern Europe, especially how residents in this region have navigated the transition from state socialism to accession to the European Union. Topics include: the legacies of state socialism; cultural politics; new economies; consumption; the European Union; new forms of governance; and political activism.

ANTH 130X - Special Topics in Ethnography (5)

This course on special topics in ethnography will be taught on a rotating basis by various faculty members. Precise focus of each year's courses will vary according to the instructor and will be announced by the department.

Prerequisite: Prerequisite(s): ANTH 2.

ANTH 131 - Gender in Cross-Cultural Context (5)

Examines the diversity of women's as well as men's roles, experiences, and self-conceptions in a number of societies to explore how women and men shape, and are shaped by, particular forms of social life.

ANTH 131H - Russian-Language Readings Course: Readings in Anthropology of Russia (2)

Contemporary topics and readings in anthropology of Russia and the former Soviet Union. All readings, films, and other materials are in Russian. Discussions are in English. Accompanies ANTH 130H, Ethnography of Russia and Eastern Europe. Prerequisite(s): ANTH 130H and proof of Russian proficiency in reading and writing. Enrollment by permission of instructor.

ANTH 133 - Narratives of the Popular (5)

Addresses the increasing importance of popular culture as the terrain upon which to address issues of culture and power. Emphasizes an ethnographic approach to popular culture as sociocultural phenomena. Students learn about a variety of activities including television and film viewing, music, fashion, photography, postcards, comic books, and urban spatial relations and architecture.

ANTH 134 - Medical Anthropology: An Introduction (5)

Cross-cultural study of health, disease, and illness behavior from ecological and ethnomedical perspectives. Implications for biomedical health care policy. Students cannot receive credit for this course and ANTH 254.

Prerequisite: Prerequisite(s): ANTH 2.

ANTH 135A - Cities (5)

Examines cities from an anthropological perspective. Reviews pertinent social scientific literature of the 19th and early 20th centuries. Surveys the concepts and methods used by contemporary anthropologists to investigate urban phenomena.

ANTH 136 - The Biology of Everyday Life (5)

Addresses cross-cultural attitudes to the human body and its everyday biological concerns: sleeping, eating, breathing, sex, and defecation.

Prerequisite: Prerequisite(s): ANTH 2.

ANTH 137 - Consuming Culture (5)

Explores consumption as a cultural form. Beginning with theories of capitalism and exchange, it then focuses on sites and modes of consumption and display such as department stores, museums and zoos, advertisements and photography, cultural tourism.

ANTH 138 - Political Anthropology (5)

The ideas, in selected non-Western societies, about the nature of power, order, social cohesion, and the political organization of these societies.

ANTH 139 - Language and Culture (5)

Examination of language system and language use in relationship to cultural contexts of communication in Western and non-Western societies. Topics include the Sapir-Whorf linguistic relativity hypothesis; linguistic constructions of gender; speech variation in relation to class, ethnicity, and national identity; and the emergence of self in communicative acts.

Prerequisite: Prerequisite(s): ANTH 2.

ANTH 140 - The Body in Rain: Environmental and Medical Intersections (5)

Explores medical and environmental anthropologies, including how bodies-human and other-are implicated in processes often figured as environmental. Explores how the body and the environment combine and interact to form nexus of political, cultural, and material forces.

ANTH 142 - Anthropology of Law (5)

An ethnographically informed consideration of law, dispute management, and social control in a range of societies including the contemporary U.S. Topics include conflict management processes, theories of justice, legal discourse, and relations among local, national, and transnational legal systems.

Prerequisite: Enrollment is restricted to anthropology and legal studies majors.

ANTH 143 - Performance and Power (5)

Explores relationships between power and performance forms and media, both traditional and emergent. Links aesthetics with politics, and recent transcultural exchanges with local circumstances and consequences.

Prerequisite: Prerequisite(s): ANTH 2 or any other Anthropology course.

ANTH 144 - Anthropology of Poverty and Welfare (5)

Examines phenomena of poverty and welfare in cross-cultural perspective with an emphasis on critical ethnographies and social analyses of social pathologies, economic systems, and community. Topics include informal economies, labor, household systems, social-support networks, and public policies.

ANTH 145X - Special Topics in Socio-Cultural Anthropology (5)

Taught annually on a rotating basis by faculty members. Each year's topic varies by instructor and is announced by the department.

Prerequisite: Prerequisite(s): ANTH 2.

ANTH 146 - Anthropology and the Environment (5)

Examines recent approaches to study of nature and the environment. Considers historical relationship between nature, science, and colonial expansion as well as key issues of contemporary environmental concern: conservation, environmental justice, and social movements. Students cannot receive credit for this course and ANTH 246.

Prerequisite: Prerequisite(s): ANTH 2.

ANTH 147 - Anthropology and the Anthropocene (5)

Looks at how humans have lived with their environments in other times and places; the long-distance transfers of humans and other animals, as well as plants and microorganisms; and how we can best live in the Anthropocene.

Prerequisite: Prerequisite(s): ANTH 2.

ANTH 148 - Gender and Global Development (5)

Uses the critical tools of feminist theory and cultural anthropology to look at how global development discourses and institutions mobilize, reinforce, and challenge systems of gender-based inequality. Topics include non-governmental organizations (NGOs), development practice, microcredit, and technocrat cultures. (Formerly Gender and Development.)

ANTH 149 - Anthropology of Activism (5)

Examining activism from an anthropological perspective, students look at beliefs, ideals, and practices of social movements and those involved in them. Taking a procedural approach, course focuses on how things happen in unexpected ways, and examines activism as a collective matter.

ANTH 150 - Communicating Anthropology (5)

Encourages anthropology majors to explore different means of communicating anthropology with much attention to individual writing and presentation skills. Intensive work on library research; recognizing, comparing, and making arguments; and analyzing ethnographies, articles, reviews, and films.

Prerequisite: Prerequisite(s): two of the following courses: ANTH 1, ANTH 2, or ANTH 3; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to sophomore and junior anthropology majors.

ANTH 151 - Workshop in Ethnography (5)

Through demonstration, practice, and participation, acquire skills in collecting and analyzing cultural data. Work with members of other cultures and with each other to learn to identify significant cultural patterns. Lectures and readings provide added perspective and a theoretical base.

Prerequisite: Prerequisite(s): ANTH 2.

ANTH 152 - Survey of Cultural Anthropological Theory (5)

Major figures, ideas, and writings in 19th- and 20th-century cultural anthropology surveyed. Students cannot receive credit for this course and ANTH 252.

Prerequisite: Prerequisite(s): ANTH 2 and satisfaction of the Entry Level Writing and Composition requirements; enrollment is restricted to anthropology majors.

ANTH 153 - Medicine and Colonialism (5)

Addresses the overlapping relationship between medicine and colonialism in the 19th century, with attention to post-colonial theory and contemporary studies of post-colonial medical pluralism in the 20th century.

Prerequisite: Prerequisite(s): ANTH 2 and ANTH 134.

ANTH 157 - Modernity and Its Others (5)

Beginning with the conquest of the Americas, considers how Western thinkers have explained seemingly irrational ways of being and thinking (like witchcraft, human sacrifice, and bodily mutilation), and asks how we interpret beliefs and practices radically different from our own.

ANTH 158 - Feminist Ethnographies (5)

Considers the relationship between anthropology and feminism. Provides historical perspective on gender inequalities in the discipline as well as the emergence of feminist anthropology. Students read and engage with examples of feminist ethnography from a variety of regions and subfields.

ANTH 159 - Race and Anthropology (5)

Examines concept of race in anthropology. Begins with histories of race in anthropology; turns to contemporary analysis of racism, identity formation, and diaspora; and concludes with current debates on the validity of race as an object of analysis.

ANTH 160 - Reproductive and Population Politics (5)

Examines reproductive and population politics across the globe, with a focus on feminist and ethnographic analyses of the stakes of various actors, from states to religious bodies to non-governmental organizations, in questions of who reproduces and in what circumstances.

ANTH 161 - The Anthropology of Food (5)

Critically examines food as a fundamental aspect of social and cultural life and key concept in the development of anthropological theory and methods. Topics include: power relationships; community building; exchange and reciprocity; symbolism; cultural rules and rituals; globalization; and memory.

ANTH 161S - Anthropology of Food, Abroad (5)

Food as a fundamental aspect of social/cultural life and key concept in development of anthropological theory and methods. Studying abroad, investigations are grounded in local ethnographic context to learn how anthropologists study food, practice methods, and understand food's local importance.

ANTH 162 - Anthropology of Displaced Persons (5)

Examines the causes, consequences, forms, and experiences of human movement, displacement, and abandonment. Topics include: migration, refugees, forced displacement, environmental displacement, tourism, transnational communities, and other displaced populations.

ANTH 163 - Kinship (5)

Provides a critical survey of debates, old and new, in the study of kinship. Readings range from classical treatments to recent reformulations that use kinship as a lens for exploring intimacy, memory, futurity, embodiment, commodification, and power. Students cannot receive credit for this course and ANTH 263.

ANTH 164 - The Anthropology of Dance (5)

An intense reading seminar which critically reviews anthropological works in dance ethnography and dance theory. Recommended for anthropology majors.

Prerequisite: Prerequisite(s): ANTH 2.

ANTH 166 - States, Bureaucracies , and Other Cosmological Propositions (5)

Investigates the cosmologies of states and bureaucracies and the practices through which officials or rulers seek to produce order, knowledge, or stability. Looks at paperwork, nationalist and court rituals, practices of mapping and classification, forms of citizenship.

ANTH 170 - History of Archaeological Theory (5)

Historical review of prehistoric archaeology from antiquarianism to the present. Emphasis on development of archaeological theory and its relation to evolutionary and anthropological theory. Students cannot receive credit for this course and ANTH 270.

Prerequisite: Prerequisite(s): ANTH 3; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to anthropology and Earth sciences/anthropology combined majors. Recommended for juniors.

ANTH 171 - Materials and Methods in Historical Archaeology

(5)

In this intensive, hands-on course, students learn the step-by-step processes involved in conducting laboratory research on historic artifacts. Students study the ins and outs of analyzing, cataloging, and dating historic artifacts.

Prerequisite: Prerequisite(s): ANTH 3.

ANTH 172 - Archaeological Research Design (5)

Develops practical skills for connecting archaeological theory and methods to grant writing, final reports and presentations. Examines elements of good research design, including the logic of scientific inquiry, ethics, project conceptualization, measurement, sampling, data analysis, and effective writing.

Prerequisite: Prerequisite(s): ANTH 3. Enrollment is restricted to anthropology majors.

ANTH 173 - Origins of Farming (5)

Survey of the ecological and archaeological evidence for the origins of plant and animal domestication in Africa, Eurasia, and the Americas. Discussion will center on the preconditions of this drastic alteration in human ecology and its consequences in transforming human societies. Open to nonmajors. Students cannot receive credit for this course and ANTH 273.

Prerequisite: Enrollment is restricted to juniors and seniors.

ANTH 174 - Origins of Complex Societies (5)

Deals with evidence and theories concerning the origins of complex society; the transition from egalitarian, foraging societies to the hierarchical, economically specialized societies often referred to as civilizations. Focuses on both Old World and New World cultures. Students cannot receive credit for this course and ANTH 174.

Prerequisite: Prerequisite(s): ANTH 3.

ANTH 175 - African Archaeology (5)

Introduces the evolution of African kingdoms and states from the emergence of farming communities to initial contact with Europe. Particular attention paid to the origins of social inequality and the evolution of centralized polities. Students cannot receive credit for this course and ANTH 275. (Formerly African Complex Societies.)

Prerequisite: Prerequisite(s): ANTH 3.

ANTH 176A - North American Archaeology (5)

Development of Native cultures in North America. Topics include peopling of the New World, early foragers, spread of agriculture and complex societies in the Southwest and Eastern Woodlands, and review of cultural developments in the West and Far North.

Prerequisite: Prerequisite(s): ANTH 3 or consent of instructor.

ANTH 176B - Meso-American Archaeology (5)

Review of the archaeological and ethnohistorical evidence for the origins and development of pre-Columbian civilizations in

Meso-America including the Olmec, Maya, Zapotec, Mixtec, Teotihuacan, Toltec, Tarascan, and Aztec. Students cannot receive credit for this course and ANTH 276B.

Prerequisite: Prerequisite(s): ANTH 3.

ANTH 176C - Archaeology of the American Southwest (5)

Outlines the development of native cultures in the American Southwest from Paleo-Indian times (Ca. 11,5000 B.C.) through early European contact (ca. A.D. 1600). Topics include the greater environment; early foraging culture; the development of agriculture and village life; the emergence and decline of regional alliances; abandonment and reorganization; and changes in social organization, external relations, and trade.

Prerequisite: Prerequisite(s): ANTH 3 and ANTH 176A.

ANTH 176D - Colonial Encounters in the Americas (5)

Uses archaeological case studies to explore processes of cultural confrontation, resistance, and transformation among Native American groups in the wake of European colonial expansion in the Western Hemisphere during the late 15th through mid-19th centuries.

Prerequisite: Prerequisite(s): ANTH 2 and ANTH 3.

ANTH 176E - Archaeology of the Pacific Northwest (5)

Explores some of the important issues surrounding the anthropological and archaeological study of the Pacific Northwest Coast--a roughly 1,800-kilometer-long shoreline that stretches from Yakutat Bay in Alaska to Cape Mendocino in California.

Prerequisite: Prerequisite(s): ANTH 3.

ANTH 176F - California Archaeology (5)

Introduces the Native peoples of California from an archaeological perspective. Covering the past 13,000 years, a variety of geographic and temporal settings are examined as well as current research in California archaeology.

Prerequisite: Prerequisite(s): ANTH 3.

ANTH 177 - Environmental Archaeology (5)

Introduces students to methods and theories in the study of past human-environment interactions. Examines the use of archaeological environmental data (geological, botanical, faunal, chemical) and explores topics, such as megafaunal extinctions, domestication, and human impacts on environments.

ANTH 178 - Historical Archaeology: A Global Perspective (5)

Introduces the archaeology of European colonialism and the early-modern world. Topics include historical archaeological methods; the nature of European colonial expansion in New and Old Worlds; culture contact and change; and power and resistance in colonial societies. Students cannot receive credit for this course and ANTH 278.

ANTH 180 - Ceramic Analysis in Archaeology (5)

Focuses on theories and techniques used by archaeologists to bridge the gap between the recovery of ceramic materials and their interpretation within cultural contexts. Topics include the origins of pottery, production methods, classification and typology, seriation, functional analysis, materials analysis and description, organization of production, trade, and the analysis of style. Students cannot receive credit for this course and ANTH 280.

Prerequisite: Prerequisite(s): ANTH 3. Concurrent enrollment in ANTH 180L required. Enrollment is restricted to anthropology majors.

ANTH 180L - Ceramic Analysis Laboratory (2)

Practicum in ceramic materials analysis and description. Students perform material experiments in materials selection and processing, hand-building techniques, and open-pit firing. Demonstrations of standard techniques of attribute analysis and the mineralogical and chemical characterization of ceramic materials are presented. Students cannot receive credit for this course and ANTH 280L.

Prerequisite: Prerequisite(s): ANTH 3. Concurrent enrollment in ANTH 180 required. Enrollment is restricted to anthropology majors.

ANTH 181X - Special Topics in Archaeology (5)

Taught annually on a rotating basis by various faculty members. Precise focus of each year's course varies according to the instructor and is announced by the department.

Prerequisite: Prerequisite(s): ANTH 3.

ANTH 182A - Lithic Technology (5)

Introduction to lithic and ceramic analysis in archaeology. Includes lab analysis, discussions of classification and typology, and exploration of the concept of style as it relates to ceramics and lithics in archaeology.

Prerequisite: Prerequisite(s): ANTH 3.

ANTH 184 - Zooarchaeology (5)

Lectures and seminar on archaeological faunal analysis. Topics include mammalian evolution and osteology, vertebrate taphonomy, reconstruction of human diet from faunal remains, foraging strategy theory, data collection and management, and methods of quantitative analysis. Students cannot receive credit for this course and ANTH 284.

Prerequisite: Prerequisite(s): ANTH 3; concurrent enrollment in ANTH 184L is required.

ANTH 184L - Zooarchaeology Laboratory (2)

Practical laboratory in archaeological analysis, with demonstrations and exercises on human-caused modifications to animal bones and non-human modifications to animal bones.

Prerequisite: Prerequisite(s): ANTH 3 and concurrent enrollment in ANTH 184. Enrollment is restricted to

anthropology majors and combined Earth sciences/anthropology majors.

ANTH 185 - Osteology of Mammals, Birds, and Fish (5)

Practicum in archaeological faunal analysis. Students learn to identify bones of all larger mammal species of central California plus selected bird and fish species. Students cannot receive credit for this course and ANTH 285. Prerequisite(s): ANTH 184 or ANTH 102 or BIOL 138 BIOL 138L or EART 100 or ENVS 105 ENVS 105L, and permission of instructor.

ANTH 187 - Cultural Heritage in Colonial Contexts (5)

Critical examination of the definitions of cultural heritage, its development as a concept, and the various laws, charters, and conventions that shape our management of the past in the present. The focus is on heritage in comparative colonial contexts.

ANTH 187B - Cultural Resource Management (5)

Explores how the past is managed or cared for in the present, especially in the context of the United States.

Prerequisite: Prerequisite(s): ANTH 3.

ANTH 188A - Practicum in Archaeology A (2)

Introduces practical skills in archaeological materials identification of stone, shell, bone, and other materials, curation, and database management. Students receive entry-level training with once-weekly class meetings and five hours per week of hands-on work. Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3, and instructor consent. All three courses in sequence (ANTH 188A, ANTH 188B, ANTH 188C) required to count for the anthropology major or minor.

ANTH 188B - Practicum in Archaeology B (2)

Introduces practical skills in archaeological materials identification of stone, shell, bone, and other materials, curation, and database management. Students receive entry-level training with once-weekly class meetings and five hours per week of hands-on work. Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3, and instructor consent. All three courses in sequence (ANTH 188A, ANTH 188B, ANTH 188C) required to count for the anthropology major or minor.

ANTH 188C - Practicum in Archaeology C (2)

Two-credit course introducing practical skills in archaeological materials identification of stone, shell, bone, and other materials; curation; and database management. Students receive entry-level training with once-weekly class meetings and five hours per week of hands-on work. Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3. All three courses in sequence (ANTH 188A, ANTH 188B, ANTH 188C) required to count for the anthropology major or minor.

ANTH 189 - Archaeology Field Methods (5)

Lecture, laboratory, and fieldwork sessions on archaeological field methods including survey, mapping, excavation, record and database maintenance, artifact accessioning, curation, and analysis on the UCSC campus. Students attend

lectures/laboratories two evenings each week and do fieldwork all day on Saturdays. Enrollment by instructor consent. Prerequisite(s): course 3 and application letter. Students who have done no previous fieldwork in archaeology have priority.

ANTH 190X - Special topics in Biological Anthropology (5)

Taught annually on a rotating basis by various faculty members. Precise focus of each year's course varies according to the instructor and is announced by the department. (Formerly Special topics in Archaeology-Physical Anthropology.)

Prerequisite: Prerequisite(s): ANTH 1.

ANTH 194A - Anthropology of Dead Persons (5)

Explores the cultural meanings of dead bodies and dead persons, including memorialization; the body in the United States legal system; cadavers in education and research; dead persons in mass disasters and human-rights cases; and repatriation of the dead. Prerequisite(s): Satisfaction of the Entry Level Writing and Composition requirements, and ANTH 1, ANTH 2, and ANTH 3. Enrollment restricted to senior anthropology and Earth sciences/Anthropology combined majors. Enrollment by permission of instructor.

ANTH 194B - Chimpanzees: Biology, Behavior, and Evolution (5)

Explores studies on wild and captive chimpanzees with reference to other apes and humans. Topics include sociality, tool using, locomotion, traditions, and life history; social and physical dimensions of growth and development; language studies, genetics, and applications to human evolution.

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3; satisfaction of the Entry Level Writing and Composition requirement. Enrollment is restricted to senior anthropology majors.

ANTH 194C - Feminist Anthropology (5)

Considers feminist perspectives on the human past, archaeologists' perspectives on feminist theory, and the impact of gender, feminist, and critical social theory on archaeology as a profession. Students cannot receive credit for this course and ANTH 279.

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3, and satisfaction of the Entry Level Writing and Composition requirement. Enrollment restricted to senior anthropology and Earth sciences/Anthropology combined majors.

ANTH 194D - Tribes/Castes/Women (5)

Examines historical constructions and contemporary deployments of the categories that have structured popular and anthropological understandings of social life in South Asia, particularly those of tribe, caste, and women. Students gain familiarity with the mobilization of these categories in contemporary political movements across India.

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3. Satisfaction of the Entry Level Writing and Composition

requirements. Enrollment is restricted to senior anthropology majors.

ANTH 194E - Belief (5)

Focuses on problems and opportunities raised by the concept of belief. Students work to develop an anthropological understanding of belief as practiced, then put it to use in analyzing episodes from the NPR series *This I Believe*.

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3 and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior anthropology majors.

ANTH 194F - Memory (5)

Intensive and fast-paced seminar focusing on theoretical and ethnographic studies of memory as a means for dealing with the past. Examines how ordinary people and societies have coped with the past through acts of selective remembering and forgetting.

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3; satisfaction of the Entry Level Writing and Composition requirement. Enrollment is restricted to senior anthropology majors.

ANTH 194G - Politics and Secularism (5)

Examines secularism as political doctrine and practice of government. Topics include: transformation of religion by secularization; forms of inclusion/exclusion enacted by secularism; relationship between secularism and colonial rule. Case studies drawn from Europe, South Asia, United States, and the Middle East.

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3, and satisfaction of the Entry Level Writing and Composition requirements; enrollment is restricted to senior anthropology majors.

ANTH 194H - Paleoanthropology (5)

Detailed overview of the evidence for the origin and evolution of humans with emphasis on reconstructing the paleobiology of extinct hominids. Discussion of individual groups of ancient hominids from the Miocene apes to anatomically modern humans.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; ANTH 1, ANTH 2, and ANTH 3. Enrollment is restricted to senior anthropology and Earth sciences/Anthropology combined majors.

ANTH 194I - Consumption and Consumerism (5)

Investigates cultural analysis of consumer society, commodities, and consumer practices. Students develop their own research projects. Themes include: critiques of consumer society; symbolic analysis of goods, consumption as resistance, anthropologies of marketing, culture jamming; consumption and (post) colonialism.

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3; satisfaction of the Entry Level Writing and Composition

requirement. Enrollment is restricted to senior anthropology majors.

ANTH 194J - Histories of Forests and Other Wild Places (5)

Wild Nature has a history. This class offers tools for understanding the social and natural construction of wild nature. We will learn to read rural landscapes—ethnographically, biologically, historically, creatively, and politically.

Prerequisite: Prerequisite(s): satisfaction of Entry Level Writing and Composition requirements. Enrollment is restricted to senior anthropology majors.

ANTH 194K - Reading Ethnographies (5)

Explores issues in the representation of culture through reading and discussing ethnographies. Recent experimental ethnographies open topics including the relation between fieldwork and writing, textual strategies, and the politics of ethnographic writing and research.

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior anthropology majors.

ANTH 194L - Archaeology of the African Diaspora (5)

Senior seminar on African diaspora archaeology. Draws on archaeological, historical, and anthropological perspectives to examine the cultural, social, economic, and political lives of Africans and their descendants in the New World and West Africa from the 15th through 19th centuries.

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, ANTH 3 and an upper-division course in archaeology; satisfaction of the Entry Level Writing and Composition requirement. Enrollment is restricted to senior anthropology majors.

ANTH 194M - Medical Anthropology (5)

Focuses on critical issues in the social sciences of health and healing. Designed for students pursuing graduate work in medical anthropology and/or public health.

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, ANTH 3, and ANTH 134; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior anthropology majors.

ANTH 194N - Comparison of Cultures (5)

Seminar for upper-division students interested in theories and methodology of social and cultural anthropology. Devoted to critical discussion of different methods of comparison practiced in anthropology.

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior anthropology majors.

ANTH 194O - Masculinities (5)

Considers the social construction of men and masculinities in a variety of ethnohistorical contexts as well as the unique contribution enabled by anthropological methods, particularly ethnographic fieldwork, to the study of gender and power.

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3 and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior anthropology majors.

ANTH 194P - Space, Place, and Culture (5)

Examines ways anthropologists have studied relationship between space, place, and culture. Covers early formulations acknowledging people in different cultural contexts ascribe particular meanings to places and to the concept of space and then traces the ways these questions have come to the fore in more recent scholarship.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior anthropology majors.

ANTH 194Q - Race, Ethnicity, Nation (5)

Provides students with theoretical and methodological approaches to studying the relationships between race, ethnicity, and nation, with a comparative focus on the United States, Latin America, and Europe. Students use ethnographic methods and/or discourse analysis to develop individual research projects.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, and ANTH 1, ANTH 2, and ANTH 3. Enrollment is restricted to senior anthropology majors.

ANTH 194R - Religion, Gender, Sexuality (5)

Examines religion in relation to gender and sexuality. Examines how gender, sexuality, and religion intersect in notions of civilization, progress, and modernity in the contemporary and colonial periods. Particular attention paid to Islam, Christianity, and Hinduism.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, and ANTH 1, ANTH 2, and ANTH 3. Enrollment is restricted to senior anthropology majors.

ANTH 194S - Hearing Culture: The Anthropology of Sound (5)

Explores relationships between culture and acoustic worlds--environmental, verbal, and musical--within which we live. How sound is shaped by human belief and practice and the role sound plays in cultural and social life, both past and present.

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior anthropology majors.

ANTH 194T - Poverty and Inequality (5)

Through ethnographies about homelessness, food deprivation, and unemployment, examines the institutions through which poverty is recognized, the systems of morality shaping debates about need and appropriate behavior, and the effects of community responses to poverty.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; ANTH 1, ANTH 2, and ANTH 3. Enrollment is restricted to senior anthropology majors.

ANTH 194U - Environmental Anthropology: Nature, Culture, Politics (5)

Presents key readings in environmental anthropology focusing on environmental conflicts. Students guided in developing research paper on a society environment topic of their choice. Class is writing intensive with in-class discussion and final presentations.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior anthropology majors.

ANTH 194V - Who Owns the Past? Ethical and Political Dimensions of Contemporary Archaeology (5)

Considers the various stakeholders in archaeological practice. Students identify and evaluate the ethical and political issues involved in the study, interpretation, presentation, and conservation of the archaeological past through weekly readings, discussions, and case studies.

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3, and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior anthropology majors and Earth sciences and anthropology combined majors.

ANTH 194W - The Anthropology of Social Movements (5)

Focuses on the anthropology of social movements, especially the impact that global capital provokes on peripheral Latin American societies and the ways these respond through the organizing of social movements validating alternative worldviews that coalesce around issues pertaining to indigeneity, the environment, gender, and concepts of human dignity.

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3, and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior anthropology majors.

ANTH 194X - Women in Politics: A Third World Perspective (5)

Focuses cross-culturally on the status of women in the Third World and their formal and informal participation in politics. Also discussed are organized efforts, through participation in both national and autonomous movements, for women's rights.

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3; satisfaction of the Entry Level Writing and Composition

requirements. Enrollment is restricted to senior anthropology majors.

ANTH 194Y - Archaeologies of Space and Landscape (5)

Examines contemporary archaeological perspectives on space and landscape. Focuses on how archaeology can contribute to an appreciation of the economic, cultural, and political factors that shape human perception, use, and construction of the physical world.

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3; an upper-division archaeology course; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior anthropology majors.

ANTH 194Z - Emerging Worlds (5)

Addresses encounters and contact zones between cultures that give rise to emerging worlds. Emerging worlds refers to the cultural heterogeneity and diversity created within world-making networks, geographies, innovations, and meanings, moving us beyond ideas about vanishing, autonomous cultures.

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3, and satisfaction of the Entry Level Writing and Composition requirements; enrollment is restricted to senior anthropology majors.

ANTH 195A - Senior Thesis Seminar (5)

Covers the basics like the planning and organization of research; writing research proposals; the publication and presentation of scientific research results; the recapitulation of laboratory methods; and intensification of specific recent research discussions in anthropology. Prerequisite(s): ANTH 1 and ANTH 107, and either ANTH 101, or ANTH 104, or ANTH 105. Enrollment is restricted to senior anthropology majors and by permission of the instructor. Students cannot receive credit for this course and ANTH 295A.

ANTH 195B - Senior Thesis Research (3)

Students conduct the research projects they proposed in ANTH 195A. Students have weekly group meetings with the research supervisor.

Prerequisite: Prerequisite(s): ANTH 195A. Enrollment is restricted to senior anthropology majors.

ANTH 195C - Senior Thesis Capstone (3)

Students finalize their research projects and write their thesis in the form of a research paper that is in publishable form so it can be submitted to a relevant journal or conference.

Prerequisite: Prerequisite(s): ANTH 195B. Enrollment is restricted to senior anthropology majors.

ANTH 195S - Senior Thesis (5)

Produce a quality research paper focusing on an anthropological topic of interest to you and that builds upon your experience in the major. Develop effective writing strategies and research skills to assist in professional development.

Prerequisite: Prerequisite(s): Satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to anthropology majors. Enrollment is by permission of the instructor.

ANTH 196C - Traveling Cultures (5)

Considers why traveling cultures have posed a threat, often met with violence, to regimes of rule, particularly modern nation-states. Also explores the unique problems that conducting research with mobile communities poses for the ethnographer.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; and ANTH 1, ANTH 2, and ANTH 3. Enrollment is restricted to senior anthropology majors.

ANTH 196D - Food and Medicine (5)

Examines the intersections of food, medicine, and culture with special focus on nutrition, cultural knowledge, industrial foodways, genetically modified organisms (GMOs), ethnopharmacology, food safety, and biosecurity.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; and ANTH 1, ANTH 2, and ANTH 3.

ANTH 196E - Pastoralists Past and Present (5)

Senior seminar treating the history and modern situation of the world's herding peoples. Readings draw on ethnographic, historical, archaeological, and ecological literatures. Students are coached in writing a 25-page research paper on a topic related to this theme.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; and ANTH 1, ANTH 2, and ANTH 3. Enrollment is restricted to senior anthropology majors.

ANTH 196F - The Anthropology of Things: Gift, Sign, Commodity, Tool (5)

Examines some approaches used by anthropologists and other thinkers to bring things into focus: as gifts, signs, commodities, and tools. Explores whether, by taking things seriously, anthropologists might learn to be empirical in new ways. Students cannot receive credit for this course and ANTH 225.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; and ANTH 1, ANTH 2, and ANTH 3. Enrollment is restricted to senior anthropology majors.

ANTH 196G - Queer Worlds: Sexuality, Intimacy and Power in Contemporary Ethnography (5)

How do we read, write, and recognize the queer body? How is it marked in politics, in intimate spaces, and in the ethnographic text? Drawing on ethnic studies and black queer studies, this seminar engages contemporary anthropological approaches to sexuality.

Prerequisite: Prerequisite(s): Satisfaction of the Entry Level Writing and Composition requirements; and ANTH 1, ANTH 2,

and ANTH 3. Enrollment is restricted to senior anthropology majors.

ANTH 196H - Global History and the Longue Duree (5)

Emerging anthropological approaches to global history, with an eye to historical frameworks of 500 years or more. Course requires engagement with advanced theoretical concepts and challenging historical texts. Intensive seminar format. Students cannot receive credit for this course and ANTH 269.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; and ANTH 1, ANTH 2, and ANTH 3. Enrollment is restricted to senior anthropology majors.

ANTH 196I - Hard Problems (5)

Explores interrelated, long-standing, difficult problems in human theory. Considers why these problems are so forbidding; what makes them significant; why they are hard; and whether hard problems come in different varieties or strengths.

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3; and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior anthropology majors.

ANTH 196J - Imagining America (5)

Explores sites of heritage and the politics of cultural memory in the American context. Focuses on public representation and interpretation at places where multiple views of history come into conflict.

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3 and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior anthropology majors.

ANTH 196K - Settler Colonialism (5)

Provides seniors in anthropology a capstone experience. Settler colonialism is an all-encompassing, land-centered project that revolves around the elimination of the Native. This course revolves around a series of ethnographies and histories about settler colonialism.

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3 and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior anthropology majors.

ANTH 196L - Archaeology of the American Southwest (5)

Outlines the development of native cultures in the American Southwest from Paleo-Indian times (ca. 11,500 B.C.) through early European Contact (ca. A.D. 1600).

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3 and satisfaction of the Entry Level Writing and Composition requirements. ANTH 178 is strongly recommended. Enrollment is restricted to senior anthropology and Earth sciences/Anthropology combined majors.

ANTH 196M - Modernity and its Others (5)

Examines how Western modernity has interpreted various forms of radical difference, beginning with the 15th-century conquest of the New World. Considers historical and contemporary examples of how Western thinkers have explained irrational beliefs and practices (e.g., witchcraft, human sacrifice, devil-worship).

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3; and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior anthropology majors.

ANTH 196N - The Body, Narrative, and Creative Practice (5)

Seminar proposing that arts, such as dance, weaving, and creative writing, and the cultivation of more traditional scholarly works can and should be pursued together. The pursuit of such research-creation is a social justice practice that values many ways of knowing and can lead to emotionally compelling and politically effective communication. Students are introduced to concepts and debates from crip theory, feminist, queer, and critical race studies, performance studies, and narrative theory. They also participate in workshops using body-centered writing, moment work, visual arts, and embodied listening to produce creation-scholarship in a medium of their choice. Taught in conjunction with ANTH 296N; students cannot receive credit for this course and ANTH 296N.

Prerequisite(s): Satisfaction of the Entry Level Writing and Composition requirements; and ANTH 1, ANTH 2, and ANTH 3. Enrollment is restricted to senior anthropology majors and by permission of instructor.

ANTH 196O - Gender and Politics (5)

Analyzes how gender defines those who participate in the public sphere and circumscribes their actions, with particular attention to individuals who identify as female and are engaged in political activities.

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3; and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior anthropology majors.

ANTH 196P - Disability and Difference (5)

Challenges limiting conceptions of what it means to be human in a range of arenas, from our understandings of culture to our conceptions of built space to our assumptions about citizenship, asking why disability makes people nervous.

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3; and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior Anthropology majors.

ANTH 196Q - Property (5)

Analyzes and denaturalizes property as a key aspect of social life and power relations. Students develop their own research projects. Themes include: concepts of property; politics of private property, home and rent; racialized dispossession; and cultural appropriation.

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3, and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior anthropology majors.

ANTH 196R - Design Anthropology (5)

Senior seminar introduces students to principles, approaches, methods, and professional dimensions of design anthropology. Emphasizes collaborative methods and development of new methods for ethnographic research, analysis, and communication. Through a quarter-long research project, students develop professional skills and portfolio materials. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to senior anthropology majors and is by permission. Students cannot receive credit for this course and ANTH 208C.

ANTH 196T - Archaeology of Technology (5)

Examines approaches mobilized by archaeologists to reconstruct ancient technologies and to explore how technological practices are implicated in processes of social formation and change. Approaches that engage technology as embodied technique and situated cultural practice are emphasized.

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3, and satisfaction of the Entry Level Writing and Composition requirement. Enrollment is restricted to senior anthropology and Earth sciences/Anthropology combined majors.

ANTH 196U - Historical Anthropology (5)

Provides seniors in anthropology a capstone experience. Involves critical engagement with archaeological, ethnohistorical, ethnographic, and oral line of evidence to evaluate the outcomes of indigenous people's interactions with different forms of missionary, settler, and mercantile colonialism.

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3, and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior anthropology and Earth sciences/Anthropology combined majors.

ANTH 196V - Radical Craft (5)

Examines how making and artisanship can be harnessed to solve challenging social, political, and environmental issues. Examines anthropology's historical role in creating a dichotomy between "art" and "craft," as well as contemporary ethnographic work that examines craft practices from weaving to pottery to the creation of mask trees for mutual aid during a time of global pandemic. Weekly topics include research-creation, "craftivism," speculative design, Indigenous art worlds, and responses to the environmental and social ravages of fast fashion. Students select a pressing social problem and then complete a hands-on, craft-based project of their choice; no prior skills or talents are required.

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3, and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior anthropology majors.

ANTH 196W - Anthropology of Weather and Exposure (5)

Students discuss how differing approaches to weather and exposure generate different approaches to culture, science, and politics; identify key moments in cultural anthropology's engagement with environmental and climactic questions; and delineate new areas of research.

Prerequisite: Prerequisite(s): ANTH 1, ANTH 2, and ANTH 3. Satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior Anthropology majors.

ANTH 197 - Laboratory Tutorial (5)

Independent laboratory research on selected topics in archeology and physical anthropology. Interview with appropriate instructor required.

ANTH 197F - Laboratory Tutorial (2)

Independent laboratory research on selected topics in archaeology and physical anthropology. Interview with appropriate instructor required. Enrollment restricted to anthropology majors.

ANTH 198 - Independent Field Study (5)

Off-campus field study. Students submit petition to sponsoring agency.

ANTH 198F - Ind Field Study (2)

Ind Field Study

ANTH 198G - Independent Field Study (3)

Off-campus field study. Students submit petition to sponsoring agency.

ANTH 199 - Tutorial (5)

Students submit petition to sponsoring agency.

ANTH 199F - Tutorial (2)

Tutorial

Graduate

ANTH 200 - Theoretical Foundations of Physical Anthropological Research (5)

Provides historical and theoretical foundation of physical anthropology. Grounds students in the changing frameworks and perspectives during the last 150 years regarding questions in human biology, evolution, nature, and culture, by examining texts and scientific journals.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 200A - Cultural Graduate Core Course (5)

Introduces history, ethnography, and theory of cultural anthropology with emphasis on awareness of construction of anthropological canon and areas of conflict within it, leading up

to contemporary debates on a variety of issues. Two-term course: students must enroll in both quarters.

Prerequisite: Enrollment is restricted to anthropology graduate students.

ANTH 200B - Cultural Graduate Core Course (5)

Introduces history, ethnography, and theory of cultural anthropology with emphasis on awareness of construction of anthropological canon and areas of conflict within it, leading up to contemporary debates on a variety of issues. Multiple-term course; students must enroll in both quarters to receive academic credit.

Prerequisite: Enrollment is restricted to anthropology graduate students.

ANTH 201 - Human Evolution (5)

Provides an overview of the first five million years of human evolution and a framework for studying evolution and reconstructing the human past. Emphasizes that all lines of evidence must be included: hominid fossils, archaeology, paleoecology, and molecular data.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 202A - Skeletal Biology (5)

Focuses on human skeletal biology, the identification of elements, physiology of hard tissue formation, growth, and maintenance. Students are required to show competence in skeletal identification to pass this class.

Prerequisite: Prerequisite(s): ANTH 102A or permission of instructor. Enrollment is restricted to graduate students.

ANTH 208A - Ethnographic Practice (5)

Introduces graduate students to the practice of fieldwork. Students design and carry out a quarter-long research project exploring a range of methods and producing an analytical case study. Readings and discussion emphasize both methodological critique and successful implementation.

Prerequisite: Enrollment is restricted to anthropology graduate students.

ANTH 208C - Design Anthropology (5)

Introduces the principles, approaches, methods, and professional dimensions of design anthropology. Emphasis is on collaborative methods and development of new methods for ethnographic research, analysis, and communication. Through a quarter-long research project, students develop non-academic professional skills, including portfolio materials. Students cannot receive credit for this course and ANTH 196R.

Prerequisite: Open to second-year graduate students and higher (first-year students are required to take ANTH 208A).

ANTH 210R - Religion in American Politics and Culture (5)

Introduces dominant discourses about major American religions and their role in public life with particular attention to intersecting differences, such as race, sex/gender, and disability

and to shifting religious/political boundaries. Visual and textual media, political commentary, and popular ethnographies are analyzed.

Prerequisite: Enrollment restricted to graduate students.

ANTH 211 - Human Ecology (5)

Reviews environmental, physiological, behavioral, and cultural ways that humans interact with their physical surroundings. Effects of human culture on the environment, and of the environment on the shape of human culture will be emphasized.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 212 - The Human Life Cycle (5)

Examines the human life cycle using an evolutionary framework. Examines key aspects of the human life stages using findings and concepts from developmental biology, physiology, nutrition, evolutionary ecology, and life history theory. These stages include: gestation, infancy, childhood, juvenile and adolescent periods, and senescence. Each stage of the life cycle is compared and contrasted with the developmental life of nonhuman primates and mammals. Other related topics include developmental plasticity and epigenetics.

Prerequisite: Enrollment restricted to graduate students.

ANTH 214 - Culture and Power (5)

Takes the many strands of scholarship on power relations between individuals within the context of institutions and conceptualizes how individuals come to exist through power relations, and how power is fundamental to social being.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 216 - Methods in Biological Anthropology (5)

Deepens students' understanding of methods applied in biological anthropology research. (Formerly Methods in Physical Anthropology.)

Prerequisite: Enrollment is restricted to graduate students.

ANTH 219 - Religions, States, Secularities (5)

Examines theories and case studies at the intersection of religion, states, and secularity. Topics include: secularism as a political doctrine; state and social regulation of religion and religious normativity; secular cultural practices; and lines of secular/religious entanglement and conflict.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 220 - Cartographies of Culture (5)

Examines, theoretically and ethnographically, how societies and their cultures are created and reified through spatializing practices, including border-making, mapping, landscape aesthetics, globalization, time/history/memory, movement, and other locating activities.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 224 - Anthropology of Secularism (5)

Examines secularism as a practice of government with a concomitant set of ethics. Topics include: the notion of religion necessary for secularism; forms of moral and political inclusion/exclusion enacted by secular governance; and the kind of ethical subject secularism engenders. (Formerly course 255.)

Prerequisite: Enrollment is restricted to graduate students.

ANTH 225 - The Anthropology of Things: Sign, Gift, Commodity, Tool (5)

Examines some approaches used by anthropologists and other thinkers to bring things into focus: as gifts, signs, commodities, and tools. Explores whether, by taking things seriously, anthropologists might learn to be empirical in new ways. Students cannot receive credit for this course and ANTH 196F.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 228 - Grant Writing (5)

Devoted entirely to writing grant proposals. Students either work on their graduate education fellowships or their doctoral dissertation grants or both. Reading materials consist of granting agency documents plus examples of successful applications.

Prerequisite: Enrollment is restricted to anthropology graduate students.

ANTH 229 - Constructing Regions (5)

Discusses centrality of the idea of regions in studies of culture, the history of locating social theory, and debates about area studies. Students develop area of transregional bibliographies. Primarily for second- or third-year anthropology graduate students reading area literatures.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 230 - Bodies, Images, Screens (5)

Visuality as epistemology, image-consumption, and the political and representational possibilities stemming from digitization and the World Wide Web are increasingly important issues in the humane sciences. Offers historical and critical background and the possibility of hands-on practice using visual material in current research.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 231 - Intimacy and Affective Labor (5)

Examines recent work on the role of intimacy and affective labor in value production, political mobilization, and transnational capital linkages. Special attention given to how these terms are invoked to answer methodological and narrative concerns in ethnographic writing.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 232 - Bodies, Knowledge, Practice (5)

Contemporary social theory and science both focus on bodies as critical sites of inquiry and the production of knowledge.

Explores these theoretical intersections and constructions of the body with new ethnographic works. Questions how race, gender, and culture are inscribed through bodily practice, imagery, and phenomenology.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 233 - Politics of Nature (5)

Advanced graduate seminar in environmental anthropology and science and technology studies, focusing on how nature is produced in the modern world and what political and practical significance this has in different contexts.

Prerequisite: Enrollment restricted to graduate students.

ANTH 234 - Feminist Anthropology (5)

Examines how feminist anthropology creates its objects of knowledge by focusing on questions of method and representation. The class reads across these traditional objects--women and gender, for example--to highlight the epistemological and political stakes of feminist work in anthropology.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 235 - Language and Culture (5)

An examination of language system and language use in relationship to cultural contexts of communication in Western and non-Western societies. Also examines the complex role which linguistic inquiry and models have played in broader theories of culture.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 238 - Advanced Topics in Cultural Anthropology (5)

Advanced topics in cultural anthropology. Current topics in anthropological theory and ethnography taught on a rotating basis by various faculty members. Precise focus of each seminar varies and will be announced by the department.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 241 - Social Justice (5)

Explores theoretical and methodological issues in the field of social justice with an emphasis on ethnographic analysis. Topics include: rights, obligations, justice, equality, compensation, and ethics.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 243 - Cultures of Capitalism (5)

Introduction to selected themes in political economy, stressing the work of Marx. Topics include the development of capitalism, colonialism, dependency, world systems, state formation, class consciousness, commodity fetishism, the nature of late capitalism, post-modernism, and the aesthetics of mass culture. Through political economy's interlocutors, raises questions about gender, race and ethnicity, and post-structuralist critiques.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 246 - Advanced Readings in Environmental Anthropology (5)

Survey of history and topics of contemporary interest in environmental anthropology, including political ecology, environmental history, ethnoecology, and multi-species anthropology. Additional advanced readings on contemporary environmental anthropology research. Students cannot receive credit for this course and ANTH 146.

Prerequisite: Enrollment is restricted to Anthropology graduate students or by permission of the instructor.

ANTH 247 - Critical Perspectives on Nutrition (5)

Examines emerging critiques on the science, communication, and practice of nutrition using multidisciplinary approaches. Special attention is given to the effects of modern nutrition.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 248 - Shadowy Dealings: Anthropology of Finance, Money, and Law (5)

Moves from a brief introduction to classic economic anthropology to recent work on histories of money and capitalism and cultures of financial markets, of accounting, and of legal and illegal trading practices

Prerequisite: Enrollment is restricted to graduate students.

ANTH 249 - Ecological Discourses (5)

Explores narratives of nature and their practical consequences in contests over wild places and their resources. Readings focus on the histories of forests and on analytic frameworks—ecology, social history, interpretation, cultural studies—with which to investigate competing constructions of the environment.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 252 - Survey of Cultural Anthropological Theory (5)

Major figures, ideas, and writing in 19th- and 20th-century cultural anthropology surveyed. Students cannot receive credit for this course and ANTH 152.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 253 - Advanced Cultural Theory (5)

Examines cultural anthropology's interdisciplinary practices of knowledge formation at an advanced level. Drawing on various types of theoretical texts, the course elaborates on the relationship between culture and power, taking up different themes each time it is taught.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 254 - Medicine and Culture (5)

Surveys medicine cross-culturally, with particular focus on power, tradition, and theories of embodiment. Students cannot receive credit for this course and ANTH 134.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 255 - Regulating Religion/Sex (5)

First examines the regulation of religion and the normalization of sex/sexuality as parallel modalities of secular rule in the production of modern citizens and subjects. Ultimately inquires into the relationship between proper religion and proper sexuality in secular state formations. (Formerly course 259.)

Prerequisite: Enrollment is restricted to graduate students.

ANTH 258 - Experimental Cultures (5)

Addresses the use of experiments in anthropological research, theory, and writing.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 259 - Race in Theory and Ethnography (5)

Explores theoretical and methodological approaches to the cross-cultural study of race, with an emphasis on historical and ethnographic analysis. Main approaches considered include Foucauldian, Gramscian, diaspora theory, and the everyday poetics and politics of race. (Formerly course 246.)

Prerequisite: Enrollment is restricted to graduate students.

ANTH 260 - Anthropology of Freedom (5)

Examines conceptualizations and practices of freedom across geographical space and historical time. Readings drawn from Greek philosophy, Islamic, Christian, and Buddhist religious traditions. Enlightenment philosophy, liberal and neo-thought, and contemporary ethnographies.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 261 - Replication, Mimesis, and Fakery (5)

Replicas, copies, and fakes anchored conceptually by the authentic/original enable the marketing of cultural commodities like arts and crafts, especially since the advent of photography. Course explores these commercial and signifying processes in the global art and culture market.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 262 - Documenting Cultures (5)

Follows the history of film and ethnography, media and methodology into the birth of cinema and anthropology in the early 20th century. Students learn theories of representation and media, conduct ethnographic research, and prepare a short film.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 263 - Kinship (5)

Provides a critical survey of debates, old and new, in the study of kinship. Readings range from classical treatments to recent reformulations that use kinship as a lens for exploring intimacy, memory, futurity, embodiment, commodification, and power. Students cannot receive credit for this course and ANTH 163.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 269 - Global History and the Longue Duree (5)

Emerging anthropological approaches to global history. Considers both 500-year and much longer historical frameworks. For the former, the evidence of documents, both European and non-European, is particularly important. For the latter, archaeological and evolutionary approaches are essential. Students cannot receive credit for this course and ANTH 196H.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 270 - History of Archaeology (5)

Historical review of prehistoric archaeology from antiquarianism to the present. Emphasis on the development of archaeological theory, its relation to evolutionary and anthropological theory, and themes ongoing over time. Students cannot receive credit for this course and ANTH 170.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 270A - Archaeology Graduate Core Course: History of Archaeological Theory (5)

Historical overview of archaeology, concentrating on archaeological practice in the English-speaking world from the late 19th through the 21st Centuries. Emphasis is on development of archaeological theory in its social context; its relation to evolutionary and anthropological theory; and themes ongoing over time. Students cannot receive credit for this course and ANTH 270.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 270B - Current Directions in Archaeological Theory (5)

Provides an in-depth understanding of current trends in archaeological thought, and enables students to place issues of archaeological interpretation into broader historical and theoretical frameworks. This course is a follow-up to ANTH 270, but not a substitute.

Prerequisite: Prerequisite(s): ANTH 270A. Enrollment is restricted to graduate students.

ANTH 272 - Advanced Archaeological Research (5)

Introduces graduate students to archaeological research design. Topics include: middle range theory; multistage research strategies; sampling strategies and appropriate field methodology; and issues specific to particular scales of archaeological analysis (artifact, household, site, region).

Prerequisite: Enrollment is restricted to graduate students.

ANTH 273 - Origins of Farming (5)

Survey of the ecological and archaeological evidence for the origins of plant and animal domestication in Africa, Eurasia, and the Americas. Discussion will center on the preconditions of this drastic alteration in human ecology and its consequences in transforming human societies. Students cannot receive credit for this course and ANTH 173.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 274 - Origins of Complex Societies (5)

The origins of complex society: the transition from egalitarian foraging societies to the hierarchical, economically specialized societies often referred to as states or civilizations. Focuses on both Old World and New World cultures. Students may not receive credit for this course and ANTH 174.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 275 - Tutorial in African Archaeology (5)

Graduate tutorial on the archaeology of precolonial African kingdoms and states. Particular attention paid toward the origins of social inequality and the evolution of centralized politics. Students cannot receive credit for this course and ANTH 175.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 276A - Advanced Topics in North American Archaeology (5)

In-depth examination of development of Native cultures in North America from end of last ice age to time of European contact. Focuses on specific regional trajectories and problems of social change.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 276B - Mesoamerican Archaeology (5)

Examines the pre-Columbian cultures of Mesoamerica and reviews the archaeological and ethnohistorical evidence related to the origins and development of cultures including the Olmec, Maya, Zapotec, Mixtec, and Aztec. Students cannot receive credit for this course and ANTH 176B.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 276G - Archaeology of Colonial Borderlands (5)

This seminar draws from readings in archaeology, history, and Native American/Indigenous studies to assess borderlands throughout colonial-era North America as important arenas of change and continuity for indigenous societies, including indigenous technologies, foodways, gender roles, governance, and much more.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 278 - Tutorial on Historical Archaeology (5)

Tutorial on archaeology of European colonialism and the early-modern world. Focuses on the nature of European colonial expansion in New and Old Worlds; culture contact and change; and power and resistance in colonial societies. Students cannot receive credit for this course and ANTH 178.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 279 - Feminism and Gender in Archaeology (5)

Considers feminist perspectives on the human past; archaeologists' perspectives on feminist theory; and the impact of gender, feminist, and critical social theory on the archaeological profession. Students cannot receive credit for this course and ANTH 194C.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 280 - Advanced Ceramic Analysis (5)

Advanced graduate seminar that focuses on techniques and theories used to bridge the gap between the recovery of ceramic remains from archaeological contexts and their interpretation with respect to various anthropological issues and problems. Students cannot receive credit for this course and ANTH 180.

Prerequisite: Enrollment is restricted to graduate students. Concurrent enrollment in ANTh 280L is required.

ANTH 280L - Advanced Ceramic Analysis Laboratory (2)

Emphasizes advanced techniques of ceramic analysis, including materials selection and processing, hand-building, and open-pit firings. Standard techniques for describing and measuring formal and technological attributes of pottery also presented. Students cannot receive credit for this course and ANTH 180L.

Prerequisite: Enrollment is restricted to graduate students. Concurrent enrollment in ANTH 280 is required.

ANTH 281 - Landscape Archaeology (5)

"Landscape" has emerged as a unifying concept for the interpretation of such archaeological features at multiple scales of analysis. This course answers these and other questions by examining how "landscapes" have been tackled archaeologically from multiple perspectives (settlement archaeology, "off-site" archaeology, and approaches building on ideas about culture, ideology and power).

Prerequisite: Enrollment is restricted to graduate students.

ANTH 282 - Household Archaeology (5)

Explores the theoretical and methodological challenges faced by archaeologists excavating ancient households. Students examine the social, economic, and political characteristics of households and investigate how they intersect and support the social and physical aspects of communities.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 284 - Tutorial in Zooarchaeology (5)

Lectures and seminar on archaeological faunal analysis. Topics include: mammalian evolution and osteology; vertebrate taphonomy; reconstruction of human diet from faunal remains; foraging strategy theory; data collection and management; and methods of quantitative analysis. Students cannot receive credit for this course and ANTH 184.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 285 - Osteology of Mammals, Birds, and Fish (5)

Practicum in vertebrate osteology, covering all larger mammal species of central California, plus selected bird and fish species, and topics in evolution and ecology of selected taxa. Students cannot receive credit for this course and ANTH 185.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 287 - Advanced Topics in Archaeology (5)

A graduate seminar on advanced theoretical or methodological topics pertinent to advanced graduate student and faculty interests.

Prerequisite: Enrollment is restricted to graduate students or by consent of instructor.

ANTH 287A - Advanced Topics: Indigenous Archaeology (5)

Traces the development of indigenous archaeology primarily in North America. Topics include: the Native American Graves Protection and Repatriation Act (NAGPRA) and issues of cultural patrimony; postcolonialism; decolonizing methodologies; community-based research; oral sources and other ways of knowing the past; and future directions.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 290T - Pedagogy of Anthropology (2)

Provides training in scientifically backed educational practices for new Anthropology TAs. Through reading, class discussion and activities, we explore different methods of teaching and ways to conceptualize pedagogy. Includes teaching theories; survey of educational tools and techniques; and lesson planning.

Prerequisite: Enrollment restricted to anthropology graduate students.

ANTH 292 - Graduate Colloquium (2)

Designed to offer an institutionalized mechanism for the presentation of research papers and teaching efforts by faculty and advanced graduate students.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 294N - Comparison of Cultures (5)

Seminar for students interested in theories and methodology of social and cultural anthropology devoted to critical discussion of different methods of comparison practiced in anthropology.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 294R - Advanced Readings in Biological Anthropology (5)

Introduces literature relevant to students' research emphases and allows for discussion of new scientific publications.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 295A - Scientific Method: Biological Anthropology (5)

The first core course of the Biological Anthropology Graduate Program. Students learn the principles and methods by which research projects in biological anthropology are devised and executed. Students cannot receive credit for this course and ANTH 195A.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 296N - The Body, Narrative, and Creative Practice (5)

Seminar proposing that arts, such as dance, weaving, and creative writing, and the cultivation of more traditional scholarly works can and should be pursued together. The pursuit of such research-creation is a social justice practice that values many ways of knowing and can lead to emotionally compelling and politically effective communication. Students are introduced to concepts and debates from crip theory, feminist, queer, and critical race studies, performance studies, and narrative theory. They also participate in workshops using body-centered writing, moment work, visual arts, and embodied listening to produce creation-scholarship in a medium of their choice. Taught in conjunction with ANTH 196N; students cannot receive credit for this course and ANTH 196N.

Prerequisite: Enrollment is restricted to graduate students.

ANTH 297A - Independent Study (5)

Students submit petition to sponsoring agency.

ANTH 297B - Independent Study (10)

Students submit petition to sponsoring agency.

ANTH 297C - Independent Study (15)

Students submit petition to sponsoring agency.

ANTH 297F - Independent Study (2)

Students submit petition to sponsoring agency.

ANTH 298 - Advanced Laboratory Apprenticeship (5)

Supervised tutorial in specialized analytic methods in archaeology or physical anthropology. Students collaborate on laboratory research with a departmental mentor or, with advisor's consent, with researchers on or off campus, preparing a manuscript for publication or an extensive literature review. Permission of instructor required. Enrollment restricted to graduate students.

ANTH 299A - Thesis Research (5)

Students submit petition to sponsoring agency.

ANTH 299B - Thesis Research (10)

Students submit petition to sponsoring agency.

ANTH 299C - Thesis Research (15)

Students submit petition to sponsoring agency.

APLX - APPLIED LINGUISTICS**Lower-Division****APLX 55 - Pardon My French: Politeness, Impoliteness, Swearing, Slang, and Humor (5)**

Explores the history and use of "bad;" language, including issues of politeness, impoliteness, swearing, slang, and humor. In readings, lectures and discussions, we examine contexts of

language use: who can say what, when, how and under what communicative conditions.

APLX 80 - Introduction to Applied Linguistics (5)

Introduces the field of applied linguistics, learning about language acquisition, use, and teaching in multilingual contexts from multiple disciplinary perspectives. Also, introduces research models that examine psycholinguistic, sociolinguistic, and/or educational aspects of multilingualism..

APLX 99 - Tutorial (5)

Students submit petition to sponsoring agency.

APLX 99F - Tutorial (2)

Students submit petition to sponsoring agency.

Upper-Division**APLX 101 - Second-Language Acquisition (5)**

Introduces the field of second-language acquisition. Topics include contexts of acquisition, the impact of individual differences, and basic methods of data collection and analysis.

Prerequisite: Prerequisite(s): APLX 80 or LING 50.

APLX 102 - Bilingualism (5)

An overview of bilingualism. Focuses on bilingualism as an individual phenomenon (i.e., how two languages develop and are represented in the minds of individual speakers), and as a social one (i.e., how do bilinguals interact in a community and how does this context of language contact shape their linguistic identity).

Prerequisite: Prerequisite(s): APLX 80 or LING 50.

APLX 103 - Second Language Speech (5)

Examines themes related to the acquisition of L2 phonetics and phonology, including theories and models of L2 speech learning; phonetics and phonology in L2 acquisition; as well as the training effects on L2 pronunciation.

Prerequisite: Prerequisite(s): APLX 80 or LING 50.

APLX 112 - Language and Gender (5)

Examines the relationship between language and gender. Topics include: gender differences in speech; linguistic gender norms and stereotypes; gender and the construction of identity in discourse; sexuality and language; sexism in language; social, educational, and political implications. (Formerly Languages 112.)

APLX 113 - Inter-Cultural Communication (5)

Examines intercultural communication and miscommunication between individuals and speech communities, both within North American and global contexts. Through discourse and analytic approaches, students explore cultural stereotypes and interactional expectations, among other issues, that influence the outcome of intercultural communication. (Formerly

Languages 113, Cross-Cultural Communication and Miscommunication.)

Prerequisite: Enrollment is restricted to juniors and seniors.

APLX 113I - Intercultural Communication—Global Internship (3)

Examines intercultural (mis)communication among individuals and speech communities, both within U.S. and global contexts. Using discourse and other analytic approaches, students explore cultural values, stereotypes, and interactional expectations, among other issues, that influence the outcome of intercultural communication. Enrollment is restricted to students enrolled in the Global Internship summer program.

APLX 115 - Language and Power (5)

Examines the relationship between language and power. Explores the ways in which national languages, regional and social dialects, and specific phonological morpho-syntactic, or lexical features come to be associated with particular social meanings and contribute to creating social inequality.

Prerequisite: Prerequisite(s): APLX 80. Enrollment is restricted to sophomores, juniors, and seniors.

APLX 116 - Discourse Analysis: Language Use and Context (5)

Familiarizes students with the methods and theoretical assumptions behind discourse analytic approaches to the study of language. Examines language used in specific contexts. Topics include: genres, registers; discourse organization; discourse grammar; interaction; conversation; pragmatics; and social practice.

Prerequisite: Prerequisite(s): LING 50 or by consent of the instructor. Enrollment is restricted to juniors and seniors.

APLX 122 - Linguistic Diversity & Social Justice (5)

Explores the relationship between linguistic diversity and social justice: the celebration of multilingualism on the one hand and the negative experiences of people who speak "minority" languages in "dominant" cultural contexts on the other.

Prerequisite: Prerequisite(s): APLX 80; enrollment restricted to applied linguistics and multiculturalism, language studies, and linguistics majors.

APLX 124 - Second Language Variation and Sociolinguistics (5)

Addresses issues related to the second-language acquisition and use of variable structures and the development of sociolinguistic competence. Topics include: overview of linguistic variation and sociolinguistics; immersion contexts; individual differences and predictors of success; and ultimate attainment.

Prerequisite: Prerequisite(s): APLX 101.

APLX 135 - Second Language Teaching (5)

Introduces the theories of second-language acquisition and their connection to second-language teaching. Students develop cutting-edge teaching and testing materials, and engage with

current scholarship on language instruction. Prerequisite(s): at least one year of college-level study of a foreign language, or its equivalent. Enrollment restricted to juniors and seniors, and by permission of instructor. Students cannot receive credit for this course and course 235.

APLX 136 - Second Language Assessment (5)

Introduces the fundamentals of second-language testing by presenting theories, key concepts, and practical applications in language assessment. Throughout the course, students develop their own assessment portfolios, creating materials they can use in their post-BA career.

Prerequisite: Prerequisite(s): APLX 135 or by permission of the instructor..

APLX 138 - English Grammar for TESOL (5)

What is it that teachers of English as a second/foreign language should know about the English grammar system—and about pedagogical options for teaching grammar—in order to best facilitate students' language development? Course is designed to be an accessible overview of English grammatical structures and grammar-teaching methods for practical classroom application.

APLX 190 - Research Seminar in Applied Linguistics (5)

Prepares students to conduct research in applied linguistics. Students evaluate published studies that represent both quantitative and qualitative methods.

Prerequisite: Prerequisite(s): APLX 80 and APLX 101; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to seniors.

APLX 199 - Tutorial (5)

Students submit petition to sponsoring agency.

APLX 199F - Tutorial (2)

Students submit petition to sponsoring agency.

Graduate

APLX 235 - Second Language Teaching (5)

Helps novice instructors learn about the theory and practice of language teaching and learning. Focuses on current methods used in communicatively oriented classrooms. Topics include: listening comprehension, grammar, vocabulary, reading, writing, and testing/assessment. Students cannot receive credit for this course and course 135. (Formerly Language Studies 201.)

Prerequisite: Enrollment is restricted to graduate students.

ARBC - ARABIC

Lower-Division

ARBC 1 - First-Year Arabic (5)

Introduction to Arabic language and Arabic-speaking culture with practice in all four language skills: listening, speaking, reading, and writing. Intended for students with no previous study of Arabic as well as heritage speakers.

ARBC 2 - First-Year Arabic (5)

Introduction to Arabic and Arabic-speaking culture with practice in all four language skills: listening, speaking, reading, and writing. Intended for students with no previous study of Arabic as well as heritage speakers.

Prerequisite: ARBC 1 or equivalent proficiency.

ARBC 3 - First-Year Arabic (5)

Introduction to Arabic and Arabic-speaking culture with practice in all four language skills: listening, speaking, reading, and writing. Intended for students with no previous study of Arabic as well as heritage speakers.

Prerequisite: Arabic 2 or equivalent proficiency.

ARBC 4 - Second-Year Arabic (5)

Continuation of Arabic language and Arabic-speaking culture courses with practice in all four language skills: listening, speaking, reading, and writing. Intended for students who have successfully completed Arabic 3 or possess equivalent proficiency.

Prerequisite: Prerequisite(s): ARBC 3 or equivalent proficiency.

ARBC 5 - Second-Year Arabic (5)

Continuation of Arabic language and Arabic-speaking culture courses with practice in all four language skills: listening, speaking, reading, and writing. Intended for students who have successfully completed Arabic 4 or possess equivalent proficiency.

Prerequisite: Prerequisite(s): ARBC 4 or comparable proficiency.

ARBC 6 - Second-Year Arabic (5)

Continuation of Arabic language and Arabic-speaking culture courses with practice in all four language skills: listening, speaking, reading, and writing. Intended for students who have successfully completed ARBC 5 or possess equivalent proficiency.

Prerequisite: Prerequisite(s): ARBC 5 or comparable proficiency.

ART - ART

Lower-Division

ART 10D - 2D Foundation (5)

Introduces students to the fundamental principles of two-dimensional art and design and focuses on analyzing the concepts of line, color shape, value, space, form, unity, balance, scale, proportion, texture, and emphasis to be used to express complex ideas. This course is a hybrid studio/lecture.

ART 10E - 3D Foundation (5)

Introduces students to the fundamental principles of three-dimensional art and design through basic concepts, techniques, and technical practice. Focuses on three-dimensional art and the design fundamentals of sculpture, public art, architecture, and the industrial-design process and production. This course is a hybrid studio/lecture.

ART 10F - 4D Foundation (5)

Introduces students to the fundamental principles of four-dimensional/time-based art and design through basic concepts, techniques, and technical practices. Computers and video, photo, sound, and lighting equipment are used to create short-form, time-based work. This course is a hybrid studio/lecture.

ART 15 - Introduction to Drawing for the Major (5)

Introduction to the methods, materials, and purposes of drawing to develop perceptual and conceptual skills through a series of assignments, providing various approaches to drawing as a tool for creative exploration. Discussions and critiques facilitate the development of critical skills. Designed for students considering the art major.

ART 20G - Introduction to Print Media and Drawing (5)

Introduces the methods, materials, and history of printmaking and drawing as a tool for creative exploration. Understanding and development of concepts and skills are achieved through a series of lectures, studio demonstrations and practice, assignments, and critiques.

Prerequisite: Prerequisite(s): two courses from ART 10D, ART 10E, ART 10F. Enrollment is restricted to proposed art and art majors.

ART 20H - Introduction to Sculpture and Public Art (5)

Introduces sculpture and art in public space. The course is composed of lectures, readings, discussions, studio assignments, and demonstrations.

Prerequisite: Prerequisite(s): two courses from ART 10D, ART 10E, ART 10F. Enrollment is restricted to proposed art and art majors.

ART 20I - Introduction to Photography (5)

Introduces basic skills and conceptual development in photography and related digital media through image-making in

the field, on the web, and in laboratories, through readings, discussions, and critiques.

Prerequisite: Prerequisite(s): two courses from ART 10D, ART 10E, ART 10F. Enrollment is restricted to proposed art and art majors.

ART 20J - Introduction to Drawing and Painting (5)

Introduces the practices of drawing and painting in combination with the formal vocabulary of the visual arts. A discussion of values, form, color, and figure/ground relationships enters into each class.

Prerequisite: Prerequisite(s): two courses from ART 10D, ART 10E, ART 10F. Enrollment is restricted to proposed art and art majors.

ART 20K - Introduction to New Media and Digital Artmaking (5)

Introduces digital and new media art practice. Explores the use of the computer as tool and medium. Provides a hands-on introduction to the fundamentals of graphics; digital-image acquisition and manipulation; video; web design; and computer programming. Lectures, readings, and discussions examine the history of technology artwork and technology's relationship to contemporary culture.

Prerequisite: Prerequisite(s): two courses from ART 10D, ART 10E, ART 10F. Enrollment is restricted to proposed art and art majors.

ART 20L - Introduction to Drawing (5)

Drawing course using traditional media taught online through demonstration videos, digital submissions, and small-group critiques. Introduces the basics of observational drawing in a progression designed to develop and build skills in sighting, measuring, value, and rendering. Familiarity with Canvas, access to a digital camera, and purchase of art supplies are required. Assumes 30 hours per week of coursework.

Prerequisite: Prerequisite(s): two courses from ART 10D, ART 10E, ART 10F. Enrollment is restricted to proposed art and art majors.

ART 26 - Introduction to Printmaking (5)

Survey of print medium: basic terminology, techniques, application of tools, materials, and condensed history of development of printmaking. Assignments consist of individual and collaborative projects aimed at building skills and gathering technical experience. Introduction to relief printing (black and white and color), intaglio, letterpress, and interface between photography/computer and the handmade print. Exploration of print media for communication of issues including formal aesthetics, social/psychological and personal narrative.

ART 80D - Fundamentals of Photography (5)

Introductory course for beginners. Various techniques examined and assigned in specific exercises. Work on projects using color film; this is a non-darkroom course. Examples given of photography from 1826 to the present. Balances historical study

and practice through assigned homework exercises. Students must provide their own camera, preferably one with a manual setting. No phone cameras allowed.

ART 80E - Environmental Art in the Expanded Field (5)

Examines the ways artists engage, interact, and comment upon ecology and nature in their artworks by examining environmental art from the 1960s through the present. Offers students a foundational introduction to art and artists working in the field of environmental and ecological art/activism.

ART 80F - Introduction to Issues in Digital Media (5)

Digital media was positioned as a radical new social and creative medium in the 1980s and 1990s. The ensuing decades have seen this area become ubiquitous mass media with structural inequalities, centralized ownership, environmental damage, and precarious labor conditions. At the same time, it has become the language of our time and remains a site of creativity and intervention and offers opportunities for social changes. This course provides an introduction to key issues in this area through the lens of race and ethnicity.

ART 80T - Digital Tools for Contemporary Art Practice (5)

Introduces the digital tools and mediums available to contemporary art practices. Tools are explored from a historical and theoretical context and from a technical perspective through hands-on tutorials. A variety of artworks that use digital mediums are also examined. Covers photo and vector editors, sound and video editing, basic 3D modeling, and images and interactions generated by code. Students should have basic computer literacy.

ART 80X - Ars Erotica: Sexual Imagery in Culture and Art (5)

What is sexually explicit imagery all about? Is it art, porn, trash, political hot potato, or hot commodity? This course enables students to critically explore these questions and more in an academic setting.

ART 99 - Tutorial (5)

Students submit petition to sponsoring agency.

Upper-Division

ART 101 - Introduction to Computer Programming for the Arts (5)

Combines an introduction to computer programming for beginners with special topics that are essential for the digital arts. Basic concepts of programming are developed in the JavaScript language and applied to digital arts media, such as algorithmically generated still images and animations in two and three dimensions, sound art, and music composition. Presentation of digital artwork in the theater and via the web are covered in detail.

ART 104 - Digital Video (5)

An exploration of the video medium including production using the digital video format. Digital video cameras will be used to produce digital source material to be manipulated in a non-

linear digital editing system. Image manipulation, effects, and editing will be explored. A variety of video structures, theories, concepts, and forms will be examined through production, discussions, and viewing students' and artists' work.

Prerequisite: Prerequisite(s): Three courses from: ART 15, ART 20G, ART 20H, ART 20I, ART 20J, ART 20K, ART 20L, ART 26 or by permission of instructor. Enrollment is restricted to art majors.

ART 106A - 2D Animation (5)

Introduces animation techniques, practices, history, and theories. Students learn techniques and process in 2D, stop-motion, and digital animation. Projects teach students the workflow of animating including script development, storyboarding, frame-by-frame animation, animatic, digital, and post-production. Students are required to research artists, both historical and contemporary, working in the field of animation and to be able to discuss the work. The course teaches theoretical and historical perspectives on animation and requires students to develop a critical analysis and vocabulary. (Formerly Introduction to 2D Animation).

Prerequisite: Prerequisite(s): Three courses from: ART 15, ART 20G, ART 20H, ART 20I, ART 20J, ART 20K, ART 20L, ART 26. Enrollment is restricted to art majors.

ART 106C - Stop Motion Animation (5)

Introduction to imagining, producing, and creating stop motion animations. Includes hands-on work in storyboarding, drawing and paper-based animation, pixalization, animation of everyday objects, and Claymation with basic characters and sets. Historical and contemporary animations will be viewed in class to inspire animation ideas, aesthetics, and practices. Students are billed a materials fee. (Formerly Introduction to Stop Motion Animation.)

Prerequisite: Prerequisite(s): Three courses from: ART 15, ART 20G, ART 20H, ART 20I, ART 20J, ART 20K, ART 20L, ART 26; or by permission of instructor. Enrollment is restricted to art majors.

ART 106E - 3D Modeling and Animation (5)

Independent and collaborative creative projects using advanced computer methods. May include networking projects, virtual representations, interactive multimedia, installation, performance, 3D modeling and animation, or robotics. Emphasis on advanced critical and experimental approaches to computers as a unique art medium, and contemporary research issues. Students are required to enroll in scheduled lab section.

Prerequisite: Prerequisite(s): Three courses from: ART 15, ART 20G, ART 20H, ART 20I, ART 20J, ART 20K, ART 20L, ART 26; or by permission of instructor. Enrollment is restricted to art majors.

ART 106O - 2D Animation (5)

This project-centered studio course introduces 2D animation concepts, history, techniques and contemporary practices, production strategies, processes, and tools from a practical approach rooted in a historical/theoretical context. During each

project's development, students research artists working within relevant categories and/or topics of animation, presenting findings to assist in their creative process.

ART 108 - Activate Media! New Media Art Activism and Organizing (5)

Studio-based course teaching strategies for social change, activism and organizing using new media and digital tools. Students gain experience of developing new media artworks to communicate their position on issues that affect their lived experiences and community struggles. Students develop artworks and content using new media practices, tools, systems, and strategies. The final artwork can utilize video, film, digital media, social networks, apps, games, and design among other new media art forms.

Prerequisite: Prerequisite(s): Three courses from: ART 15, ART 20G, ART 20H, ART 20I, ART 20J, ART 20K, ART 20L, ART 26; or by permission of instructor. Enrollment is restricted to art majors.

ART 110 - Intermediate/Advanced Drawing (5)

Work moves toward individual directions in drawing. A variety of media are explored. Each student is expected to do 150 hours of drawing over the quarter.

Prerequisite: Prerequisite(s): One course from ART 15, ART 20G, ART 20J, ART 20L, ART 111, ART 112, ART 119; and two from ART 20H, ART 20I, ART 20K, ART 26; or by permission of instructor. Enrollment is restricted to art majors.

ART 111 - Figure Drawing (5)

Focuses on drawing from the human figure and exploring the figure for the purpose of personal expression and social communication. Intended for the intermediate/advanced drawing student.

Prerequisite: Prerequisite(s): One course from ART 15, ART 20G, ART 20J, ART 20L, ART 110, ART 112, ART 119; and two from ART 20H, ART 20I, ART 20K, ART 26; or by permission of instructor. Enrollment is restricted to art majors.

ART 112 - Mixed Media Works on Paper (5)

This course stresses alternative drawing processes, techniques, and materials. Intended for the intermediate or advanced student.

Prerequisite: Prerequisite(s): One course from ART 15, ART 20G, ART 20J, ART 20L, ART 110, ART 111, 119; and two from ART 20H, ART 20I, ART 20K, ART 26; or by permission of instructor. Enrollment is restricted to art majors.

ART 113 - Illustrating Stories: Fantasy and Documentary Narratives (5)

This drawing/painting class is taught using New Yorker magazine covers as examples of illustration at a level of excellence that is accessible and which are examined for content and formal qualities. Work is done in drawing and painting media; some digital and mixed media may be incorporated. Painting will be water-based. Wit, humor,

restraint, and sophistication are discussed, as well as inclusivity, exclusivity, and explicit and implicit social issues.

ART 119 - Special Topics in Drawing (5)

Special topics in drawing as announced.

Prerequisite: Prerequisite(s): One course from ART 15, ART 20G, ART 20J, ART 20L, ART 110, ART 111, ART 112; and two from ART 20H, ART 20I, ART 20K, ART 26; or by permission of instructor. Enrollment is restricted to art majors.

ART 125 - Environmental Art Studio (5)

Introduces students to environmental art and design through basic concepts, techniques, and studio practice.

Prerequisite: Enrollment is restricted to juniors and seniors.

ART 130 - Intermediate/Advanced Painting (5)

Continuation of the development of a basic foundation in painting with emphasis on the development of individual, experimental procedures. A foundation in drawing is recommended.

Prerequisite: Prerequisite(s): One from ART 20J, ART 133, ART 137, ART 138, ART 139; and two non-painting lower-division studios from ART 15, ART 20G, ART 20H, ART 20I, ART 20K, ART 20L, ART 26. A foundation in drawing is recommended. Enrollment is restricted to art majors.

ART 132 - Figure Painting (5)

Students learn the classical practice of painting the nude figure from life using traditional oil painting techniques. Students study short poses, limited color, and graduate to long pose, full color.

ART 133 - Abstract Painting (5)

Exploration of abstract painting through studio work, lectures, and critiques with emphasis on progressive abstraction, minimalism, op art, and abstract expressionism as well as other 20th-century and 21st-century forms. A foundation in drawing is recommended.

Prerequisite: Prerequisite(s): One from ART 20J, ART 20L, ART 130, ART 137, ART 138, ART 139; and two non-painting lower-division studios from ART 15, ART 20G, ART 20H, ART 20I, ART 20K, ART 26. Enrollment is restricted to art majors.

ART 135 - Digital Painting (5)

Gives students a comprehensive understanding of the digital painting, from basic techniques, to new media art and industry application, to how these programs operate. Studies and assignments develop and expand skills of digital paint application. Students build a cumulative digital portfolio of all of the studies and assignments completed throughout the course.

ART 137 - Outdoor Painter's Project (5)

Explores contemporary landscape through the practice of plein air painting. Observational plein air painting will provides the

foundation for the class. Instruction includes technical instruction in materials and technique as well as conceptual material. Student may work with oils, alkyds, or acrylic on panels, paper, or canvas.

Prerequisite: Prerequisite(s): One from ART 20J, ART 130, ART 133, ART 138, ART 139; and two non-painting lower-division studios from ART 15, ART 20G, ART 20H, ART 20I, ART 20K, ART 20L, ART 26. Enrollment is restricted to art majors.

ART 138 - Facture and Meaning (5)

Explores the materials and history of painting through lectures, demonstrations, and practice in oils, egg tempera, distemper, and Flashe paint. Students participate in group practices and also work independently on projects designed by them in consultation with the instructor. A foundation in drawing is recommended.

Prerequisite: Prerequisite(s): One from ART 20J, ART 130, ART 133, ART 137, ART 139; and two non-painting lower-division studios from ART 15, ART 20G, ART 20H, ART 20I, ART 20K, ART 20L, ART 26. Enrollment is restricted to art majors.

ART 139 - Special Topics in Painting (5)

Special studies in painting as announced. A foundation in drawing is recommended.

Prerequisite: Prerequisite(s): One from ART 20J, ART 130, ART 133, ART 137, ART 138; and two non-painting lower-division studios from ART 15, ART 20G, ART 20H, ART 20I, ART 20K, ART 20L, ART 26. Enrollment is restricted to art majors.

ART 150 - Darkroom Practices (5)

Students concentrate on darkroom practices and explore visual ideas, directing their work toward individualized goals. Required work includes making photographic prints, reading historical and theoretical works, and examination of photographs.

Prerequisite: Prerequisite(s): ART 20I and two non-photography lower-division art studios from ART 15, ART 20G, ART 20H, ART 20J, ART 20K, ART 20L, ART 26. Enrollment is restricted to art majors.

ART 152A - Photographic Book (5)

This studio-based course engages with the traditions and practices of the photographic book to examine and explore both narrative and non-narrative strategies. Students create a coherent photographic photo-book. Course examines the contemporary status of the photobook as well as the rich history of the medium. Editing, sequencing, and the production of photobooks is the centerpiece of this class.

Prerequisite: Prerequisite(s): ART 20I, ART 156, and two courses from ART 15, ART 20G, ART 20H, ART 20J, ART 20K, ART 20L, ART 26. Enrollment is restricted to art majors.

ART 152C - View Camera Photography (5)

Explores the processes, materials, and techniques of large-format photography. Students learn the concepts and theories related to the view camera. Emphasizes advanced understanding of negative exposure, sheet-film processing, tonal-range manipulation, digital scanning, and large-format output. Contemporary issues and concepts explored.

ART 153 - Still to Moving: Topics in Cinematography for Artists (5)

The natural evolution from still image making to moving image making is at the heart of this course as students look at this evolution from a historical, social, conceptual, and technical perspective. Artists who have been primarily working in still photography will learn to transition to creating with moving images by addressing time, structure, sound, and installation. Advanced discussions on film and digital formats, quality of image, camera support systems, and post-production will be explored through a combination of screenings, assignments, and readings.

Prerequisite: Prerequisite(s): ART 20I; and two courses from ART 15, ART 20G, ART 20H, ART 20J, ART 20K, ART 20L, ART 26. Plus one course from ART 150 or ART 156. Enrollment is restricted to art majors.

ART 154A - Being Social: Photography and Engagement (5)

Explores historical and contemporary ways in which photography has been used to examine social issues and invites students to produce work that responds to issues that are important to them. Students learn about photograph's historical significance in raising social awareness, analyzing the aesthetic and methodological strategies of modern and contemporary photographers seeking to catalyze economic, political and cultural change through the production of images.

Prerequisite: Prerequisite(s): ART 20I and ART 156; and two courses from ART 15, ART 20G, ART 20H, ART 20J, ART 20K, ART 20L, ART 26. Enrollment is restricted to art majors.

ART 154B - Photography, Place, Environment (5)

The impact of our industrialized culture on nature is one of the most crucial and urgent issues of our times. Discussions on environmental photography, place, and landscape, set out to investigate environmental change and to explore our relation to nature. Throughout the quarter students develop an environmental photography art project that follows in the photographic tradition of raising awareness and supporting policymakers, politicians, researchers, environmentalists, and activists. Students are billed a materials fee.

Prerequisite: Prerequisite(s): ART 20I; and two courses from ART 15, ART 20G, ART 20H, ART 20J, ART 20K, ART 20L, ART 26. Plus one course from ART 150 or ART 156, or by permission of instructor. Enrollment is restricted to art majors.

ART 154C - After Archives: Photographers & Research (5)

The role of archives, photographers, and research in contemporary photographic practice is addressed by examining the special archives at the UCSC library and the Prelinger

Library in San Francisco and by curating a group exhibition. Students make a project in multiple media, such as photography, video, text, installation, and drawing prompted by UCSC Special Collections' vast archives and collections. Through studio projects, readings, discussions, and case studies, students engage the immediate context of the university as source material for their artworks as a means to explore the effect that research and knowledge production might have on contemporary artistic practice. Students are billed a materials fee.

Prerequisite: Prerequisite(s): ART 20I; and ART 150 or ART 156; and two courses from ART 15, ART 20G, ART 20H, ART 20J, ART 20K, ART 20L, ART 26. Enrollment is restricted to art majors.

ART 155 - Photo Field Research Quarter (PFRQ): California Road Trip (10)

Offers students the unique opportunity to live and learn and photograph outside the classroom, actively engaging locations across the state of California. Students will cover 2400 miles from Northern Mendocino County to the Salton Sea, Eastern Sierra, Death Valley, and Big Sur. Class exposes students to cultural, historical, and environmental issues facing California. Due to the rigor of the course, students must submit an application demonstrating the commitment and photo preparation necessary for successful completion of the class. Students are billed a materials fee.

ART 156 - Project Development in Photography (5)

Concentrates on photographic project development, developing analytical skills designed to help direct students' own photographic ideas. Helps students create a conceptual theoretical framework through image-making in the field and studio, through critique and discussion, through readings, and by studying the work of artists.

Prerequisite: Prerequisite(s): One course from ART 20I; and two non-photography lower-division art studios from ART 15, ART 20G, ART 20H, ART 20J, ART 20K, ART 20L, ART 26. Enrollment is restricted to art majors.

ART 158 - Advanced Photography (5)

Students produce a portfolio of photographs, read historical and theoretical works, and study photographs and other art works.

Prerequisite: Prerequisite(s): ART 156; and one course from ART 150, ART 152A, ART 152C, ART 153, ART 154A, ART 154B, ART 154C or ART 159. Enrollment is restricted to art majors.

ART 159 - Special Topics in Photography (5)

Special studies in photography, concentrating on specific subject matter or media. Topics may include documentary photography, landscape, alternative processes, or mixed media.

Prerequisite: Prerequisite(s): ART 150 or ART 156. Enrollment is restricted to art majors.

ART 161B - Relief/Mixed Media Printmaking (5)

Explores traditional, contemporary, and experimental processes, issues, and concepts of relief and mono/mixed media printmaking. Students gain in-depth information and working knowledge to specialize individual ideas and build artistic development through varieties of class activities.

Prerequisite: Prerequisites: ART 20G or ART 26 and two non-print lower-division media studios from ART 15, ART 20H, ART 20I, ART 20J, ART 20K, ART 20L. Enrollment is restricted to art majors.

ART 161C - Tradition and Innovation: Relief Printmaking in Korea (6)

Explores the history of printing from the world's oldest printed text developed in Korea to the latest cutting-edge technology, including laser cutting. Students study many aspects of both traditional and contemporary relief (woodblock) printmaking, both materials, tools, and techniques and the issues, concepts and history of the field. Through various class activities, field trips and cultural visits (to UNESCO World Heritage Sites) in Korea, students will be exposed to diverse and multi-regional art practices that will broaden their perspectives and increase their understanding not only in the fields of print media but in the larger contemporary visual culture.

ART 161J - Mokuhanga: UCSC Printmaking in Japan (6)

Course taught both at UCSC and at the host university in Tokyo. At UCSC, oil-based woodblock printmaking covers techniques, application of tools, materials, history, issues and concepts. In Japan, the class studies Mokuhanga, resulting in a great understanding and appreciation of this traditional process. Via class activities, field trips, excursions, and cultural visits, students encounter diverse multi-regional art practices, thus broadening perspectives and increasing understanding not only of print media but of contemporary visual culture.

ART 162A - Intaglio I (5)

Introduces students to various methods used in making intaglio prints. Encourages individual artistic growth of imagery and technique through assignments designed to explore the medium. Includes discussion and critique of work with equal emphasis on technique and concept. Students are billed a materials fee.

Prerequisite: Prerequisites: ART 20G or ART 26 and two non-print lower-division media studios from ART 15, ART 20H, ART 20I, ART 20J, ART 20K, ART 20L. Enrollment is restricted to art majors.

ART 163A - Lithography I (5)

Introduction to drawing, processing, and printing of lithographs from stone. Emphasis on discovery of tonal, textural, and expressive potential from the surface of the stone, while establishing individual directions in imagery. Condensed history of the medium, technical theory, and critique in lecture and demonstrations.

Prerequisite: Prerequisites: ART 20G or ART 26 and two non-print lower-division media studios from ART 15, ART 20H,

ART 20I, ART 20J, ART 20K, ART 20L. Enrollment is restricted to art majors.

ART 163C - Magnified Imagination: A Printmaking Approach (5)

Examines the wonders of visual magnification of the natural world by using enlargement lenses, scanner, and microscopes to create photo-based and autographic prints that enhance strange and unperceived realities. Visits to the UCSC Norris Center for Natural History, Thimann's Roof Garden and Greenhouse will provide opportunities to explore natural world specimens for projects.

Prerequisite: Prerequisite(s): ART 20G and two courses from ART 15, ART 20H, ART 20I, ART 20J, ART 20K, ART 20L, ART 26. Enrollment restricted to art majors.

ART 164A - Screenprinting (5)

Introduces water-based screen printing. Students are introduced to processes including basic equipment, printing techniques, printing papers, stenciling processes, and photographic and digital techniques. Emphasis is on continued development of content and aesthetic awareness through the possibilities of screen printing.

Prerequisite: Prerequisites: ART 20G or ART 26 and two non-print lower-division media studios from ART 15, ART 20H, ART 20I, ART 20J, ART 20K, ART 20L. Enrollment is restricted to art majors.

ART 164S - Serigraphy in Spain (5)

Introduces water-based screen printing processes including basic equipment, printing techniques, printing papers, stenciling processes, and photographic and digital techniques. Emphasis is on continued development of content and aesthetic awareness through the possibilities of screen printing.

ART 165 - Print Media in Visual Communication (5)

Explores a unique approach reviewing the printed images in visual communications. A wide blend of traditional and cutting-edge print media processes with an interdisciplinary focus will be taught for conceptualizing, producing, and presenting the printed image.

Prerequisite: Prerequisite(s): one course from ART 160B, ART 161B, ART 161C, ART 162A, ART 162B, ART 163A, ART 163B, ART 163C, ART 164A, ART 164S, ART 168, ART 169. Enrollment is restricted to art majors.

ART 166 - Art of Bookmaking (5)

Introduction to production of small edition books and multiples utilizing sequential visual imaging, narrative content, and mixed media in bookmaking. Provides instruction in conceptualizing, producing, and distributing printed artists' multiples. Ideas encouraged within a broad range of possibilities via the format of artists' books.

Prerequisite: Prerequisite(s): Three courses from: ART 15, ART 20G, ART 20H, ART 20I, ART 20J, ART 20K, ART 20L, ART

26 or by permission of instructor. Enrollment is restricted to art majors.

ART 168 - Photo-Based Printmaking (5)

Intermediate/advanced studio course exploring the processes, history, and the recent developments in contemporary photomechanical printmaking. Through experimentation and research students learn how to utilize photographic imagery, blending them in multiple layers and colors, thereby facilitating articulation of their conceptual foundations. Students are billed a materials fee.

Prerequisite: Prerequisite(s): Three courses from the following: ART 15, ART 20G, ART 20H, ART 20I, ART 20J, ART 20K, ART 20L, ART 26. Enrollment is restricted to art majors.

ART 169 - Special Topics in Printmaking (5)

Special studies in printmaking, as announced.

Prerequisite: Prerequisites: ART 20G or ART 26 and two non-print lower-division media studios from ART 15, ART 20H, ART 20I, ART 20J, ART 20K, ART 20L. Enrollment is restricted to art majors.

ART 172 - Public Art: Memory, Landscape, and Artist as Activist (5)

In-depth exploration of art in the public sphere. Students build an understanding of public art sparked by practical experience designing and developing projects. Theoretical aspects of contemporary public art, and an introduction to the range of current public art practices will be introduced through readings, lectures, and artist's talks. The combination of practical hands-on technique and theoretical ideology will enable students to fully develop their own project within the class.

Prerequisite: Enrollment is restricted to juniors and seniors.

ART 175 - Taking Art to the Streets (5)

Expands traditional definitions of art making taking art beyond the museum. Students take art making to the streets. We explore art making in the public sphere from murals to graffiti, street art to shop dropping, protests to public commissioned projects and community engaged interventions.

Prerequisite: Prerequisite(s): Three courses from ART 15, ART 20G, ART 20H, ART 20I, ART 20J, ART 20K, ART 20L, ART 26, or by consent of instructor. Enrollment restricted to art majors.

ART 180B - Sculpture II (5)

More advanced fabrication techniques in sculpture using wood, metal, industrial, and other materials. Techniques include carpentry and woodshop skills, and an introduction to sculptural forms, processes, and ideas. Demonstrations, slide lectures, and critical discussion of work help develop technical and conceptual skills.

Prerequisite: Prerequisite(s): One course from ART 20H, ART 120, ART 121, ART 122, ART 124, ART 125, ART 129, ART 172, ART 183, ART 188, or ART 189; and two non-sculpture/intermedia/public art lower-division studios from

ART 15, ART 20G, ART 20I, ART 20J, ART 20K, ART 20L, ART 26. Enrollment is restricted to art majors.

ART 181 - Art, Power & Politics (5)

Explores strategies artists use to engage political subject matter in the 21st century. Students create their own projects, research and test approaches, techniques and strategies learning from the ways national and international artists encode and convey information in creating political work. Methods range from community collaboration; to tactical culture jamming, participatory collaborative projects, activism and intervention, symbolic and gestural work, artist-led projects, performances and community projects.

Prerequisite: Prerequisite(s): three courses from: ART 15, ART 20G, ART 20H, ART 20I, ART 20J, ART 20K, ART 20L, ART 26. Enrollment is restricted to art majors.

ART 182 - Materiality of Color (5)

A research-based, studio art class in which students experiment with ideas and processes, and pursue projects exploring the materiality of color, including social and cultural effects and environmental implications. Following a sequence of short assignments paired with class critiques, students design and complete their own research-based art projects (in any media) that investigate color as a material phenomenon. Class discussions address physical, perceptual, psychological, geological, biological, cultural, social, political, philosophical and aesthetic aspects of color in concert with readings, guest lectures, field trips, technical demonstrations and visual presentations. Students harvest, make, and use dyes from plant materials grown at the UCSC Farm, and contribute to the ongoing development of a dye garden on campus.

Prerequisite: Prerequisite(s): Three courses from: ART 15, ART 20G, ART 20H, ART 20I, ART 20J, ART 20K, ART 20L, ART 26. Enrollment is restricted to art majors.

ART 183 - Metal Fabrication (5)

Focus on teaching intermediate to advanced students the processes and techniques of direct metal fabrication for contemporary sculpture and design. Explores a range of welding, cutting, and forming techniques and processes through demonstrations, slide lectures, field trips, and studio time. Demonstrations, slide lectures, and critical discussion of work help develop technical and conceptual skills.

Prerequisite: Prerequisite(s): One course from ART 20H, ART 120, ART 121, ART 122, ART 124, ART 125, ART 129, ART 172, ART 180B, ART 188, ART 189; and two non-sculpture/intermedia/public art lower-division studios from ART 15, ART 20G, ART 20I, ART 20J, ART 20K, ART 20L, ART 26. Enrollment is restricted to art majors.

ART 184 - 3D Art and Design I (5)

Emphasizes the conceptual aspects of 3D art and design using the laser cutter to prototype and experiment with construction methods and materials to create, represent, respond to, and reflect on 3D forms in space. Students learn about mixed-media fabrication techniques, materials, and processes that include using a woodshop and metal-fabrication shop. The course is

structured around assignments that develop individual expressiveness, research skills, creative industry, and class participation. Students are billed a materials fee. (Formerly 3D Art and Design: Laser Cutting and CNC Routing.)

Prerequisite: One course from ART 20H, ART 20K, ART 101, ART 102, ART 103, ART 106E, ART 108, ART 120, ART 121, ART 122, ART 124, ART 125, ART 129, ART 146T / THEA 106, ART 172, ART 180B, ART 183, ART 188, ART 189 and two courses from ART 15, ART 20G, ART 20I, ART 20J, ART 20L, ART 26. Enrollment is restricted to art majors.

ART 185 - 3D Art and Design II (5)

Expands 3D art and design principles, methodologies, process, and skills via structured projects using 3D printers and modeling. The metal-fabrication shop and the woodshop allow students to prototype and experiment with construction methods and materials used to develop assignments. The course is structured around assignments that develop critical thinking, individual industry, research skills, creative expressiveness, and class participation. Students are billed a materials fee. (Formerly 3D Art and Design: Printing and Prototyping.)

Prerequisite: One course from ART 20H, ART 20K, ART 101, ART 102, ART 103, ART 106E, ART 108, ART 180B, ART 183, ART 184, ART 188; and two courses from ART 15, ART 20G, ART 20I, ART 20J, ART 20L, ART 26. Enrollment is restricted to art majors.

ART 186 - Art and Globalization (5)

This immersive studio class explores art making in a globalized world. Studies the complex relationship between object-making, place-making, aesthetics, and cultural identity in a global context. Examines the impacts and creative responses to a global economy, networked culture and globalized art markets (art fairs and biennales) and explores artists resisting globalization, commodification and the art market, moving beyond traditional sculptural form to transcend traditional conceptions of art and art making. Students are billed a materials fee.

Prerequisite: Prerequisite(s): Three courses from: ART 15, ART 20G, ART 20H, ART 20I, ART 20J, ART 20K, ART 20L, ART 26. Enrollment is restricted to art majors.

ART 188 - Intermediate to Advanced Sculpture (Foundry) (5)

This intermediate/advanced course provides the information and facilities necessary to express ideas through the indirect process of metal casting. The lost wax method is used to manifest ideas in sculpture. Lectures and demonstrations are combined with work time in class. Students generate sculpture forms in wax then gate, invest, weld, chase, patina, and present at least one finished piece. Students are billed a materials fee. May be repeated for credit.

Prerequisite: Prerequisite(s): One course from ART 20H, ART 120, ART 121, ART 122, ART 124, ART 125, ART 129, ART 172, ART 180B, ART 183, ART 189; and two non-sculpture/intermedia/public art lower-division studios from ART 15, ART 20G, ART 20I, ART 20J, ART 20K, ART 20L, ART 26. Enrollment is restricted to art majors.

ART 189 - Special Topics in Sculpture (5)

Special topics in sculpture as announced, concentrating on specific aspects of subject matter and media.

Prerequisite: Prerequisite(s): One course from ART 20H, ART 120, ART 121, ART 122, ART 124, ART 125, ART 129, ART 172, ART 175, ART 180B, ART 183, ART 188; and two non-sculpture/intermedia/public art lower-division studios from ART 15, ART 20G, ART 20I, ART 20J, ART 20K, ART 20L, ART 26. Enrollment is restricted to art majors.

ART 190A - Writing for Artists (5)

Provides practice in using writing as a tool to support creative work--to generate ideas, to critically analyze and interpret artworks, and to communicate clearly with others about one's own work. Lectures, discussions, and visiting artist talks introduce and explore contemporary art contexts, ideas, discourses, artworks, artists, and practices to build students' capacities to place their work in the world. Readings introduce and unfold ideas for discussion, and provide examples of writing formats and purposes as they relate to art practice.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to junior and senior art majors.

ART 190B - Senior Project (5)

Advanced senior art majors create and complete a senior project to fulfill their comprehensive graduation requirement. Focuses on a weekly lecture, studio work, peer critique, and professional practices such as the documentation and exhibition of work.

Prerequisite: Enrollment is restricted to senior art majors.

ART 191 - Teaching Apprenticeship (5)

Designed for art majors at the upper-division level. Each student assists in a lower-division art course under the direct supervision of a faculty member. Students assist in technical instruction, critiques, and class discussions. May not be repeated for credit. Does not count toward upper-division major requirements. Enrollment restricted to art majors.

ART 192 - Directed Student Teaching (5)

Teaching of a lower-division seminar under faculty supervision. (See course 42.) Students should have upper-division standing with a proposal supported by a faculty member willing to supervise. Students submit petition to sponsoring agency.

ART 193 - Field Study (5)

Supervised off-campus study conducted under the immediate and direct guidance of a faculty supervisor. To be used primarily by upper-division students doing part-time off-campus study. Students submit petition to sponsoring agency. Petitions may be obtained in the Art Department Office.

ART 194 - Forms and Ideas (5)

A non-media specific class introducing a range of contemporary visual practices, contexts, issues, forms, and UCSC resources of use to artists, emphasizing relationships between material, form,

meaning and between private expression, public communication, and systems of exchange.

Prerequisite: Enrollment is restricted to junior and senior art majors. Strongly recommended for junior transfer art majors.

ART 196 - Independent Senior Project (5)

Student will concentrate on completing work for comprehensive exhibition under the direction of his or her art adviser, with help from other faculty as needed. Students submit petition to sponsoring agency.

ART 197 - Individual Study (5)

Individual study in areas approved by sponsoring instructors. Students submit petition to sponsoring agency.

ART 198 - Independent Field Study (5)

Provides for department-sponsored independent study programs off campus for which faculty supervision is not in person (e.g., supervision is by correspondence). Students submit petition to sponsoring agency.

ART 199 - Tutorial (5)

Individual study in areas approved by sponsoring instructors. Students submit petition to sponsoring agency.

ART 199F - Tutorial (2)

Tutorial

Graduate

ART 210A - Practice-Based Research Group: Sites (5)

The first in the required core course sequence taken by students in the first year of the environmental art and social practice M.F.A. The sequence offers students a graduated learning opportunity to engage in practice-based research in the field. The concept of practice-based research involves "an original investigation undertaken in order to gain new knowledge partly by means of practice and the outcomes of that practice." (Sydney) In this site-specific course, students apply research to site work and art practice.

Prerequisite: Enrollment is restricted to graduate students.

ART 210B - Practice-Based Research Group: Systems (5)

The second in the required core course sequence taken by students in the first year of the environmental art and social practice M.F.A. The sequence offers students a graduated learning opportunity to engage in practice-based research in the field. The concept of practice-based research involves "an original investigation undertaken in order to gain new knowledge partly by means of practice and the outcomes of that practice." (Sydney) Students develop their research through the lens of systems and relationships.

Prerequisite: Prerequisite(s): ART 210A. Enrollment is restricted to graduate students.

ART 210C - Practice-Based Research Group: Contexts (5)

Third in the required core course sequence taken by students in the first year of the environmental art and social practice M.F.A. The sequence offers students a graduated learning opportunity to engage in practice-based research in the field. The concept of practice-based research involves "an original investigation undertaken in order to gain new knowledge partly by means of practice and the outcomes of that practice." (Sydney) Students engage with questions of context and community.

Prerequisite: Prerequisite(s): ART 210A and ART 210B. Enrollment is restricted to graduate students.

ART 220 - Methods and Histories (5)

First-year seminar on methods of the field. Topics include: strategies for artists working in the field, social and environmental art research methods, theory as practice, histories, and case studies (artists and issues).

Prerequisite: Enrollment is restricted to graduate students.

ART 230 - Theory and Practice (5)

First- or second-year graduate seminar focusing on theories and histories related to social and environmental art practice.

Prerequisite: Prerequisite(s): ART 220. Enrollment is restricted to graduate students.

ART 240 - Art Pedagogies (2)

First-year seminar course introducing and exploring pedagogical methods and approaches in art education and in art practice. The teachings of Paolo Freire and others serve as working models to construct open and respectful learning environments both in and outside the classroom.

Prerequisite: Enrollment is restricted to graduate students.

ART 250 - Writing Matters (2)

First-year seminar course focusing on research and writing skills as a dimension of project-based art practice and as support for planning a thesis. This course can be taken for Satisfactory/Unsatisfactory grading only.

Prerequisite: Enrollment is restricted to graduate students.

ART 260 - Curatorial Collective (2)

Second-year seminar course focusing on exhibition, curatorial questions, and practices as they relate to presenting final thesis work for public reception. Covers practical, theoretical, and historical considerations for artists and researchers in the process of preparing for presenting the outcome of MFA research. Students examine multiple modalities for presentation and exhibition and address issues of diversity and access in exhibition and curatorial practices. This course can be taken for Satisfactory/Unsatisfactory grading only.

Prerequisite: Enrollment is restricted to graduate students.

ART 270A - Project Development and Critique I (5)

First in a sequence of two second-year courses, continuing the focus on students' production and critique. Through peer discussions students continue to deepen their ability to engage in conceptual, scholarly, and interdisciplinary dialogue about their projects and the work of fellow students.

Prerequisite: Prerequisite(s): ART 210A, ART 210B, ART 210C, and ART 220.

ART 270B - Project Development and Critique II (5)

Second in a sequence of two second-year courses, continuing the focus on students' production and critique. Through peer discussions students continue to deepen their ability to engage in conceptual, scholarly and interdisciplinary dialogue about their projects and the work of fellow students.

Prerequisite: Prerequisite(s): ART 270A.

ART 280 - MFA Project Production (5)

Students produce their final project in conjunction with refining and completing their written thesis. Critique, tutorials, and directed study in writing and studio production leads to the presentation of their project.

Prerequisite: Prerequisite(s): ART 270A and ART 270B. Enrollment is restricted to graduate students.

ART 297 - Independent Study (5)

Independent study or research for graduate students. Students submit petition to sponsoring agency.

ART 299F - Thesis Research (2)

Students work on integrating their writing with their project production under close supervision with a faculty member. M.F.A. students take this each quarter of their second year. Prerequisite(s): ART 210A, ART 210B, ART 210C, and ART 220.

ARTG - ART AND DESIGN: GAMES AND PLAYABLE MEDIA

Lower-Division

ARTG 80G - Visual Communication and Interaction Design (5)

Survey of the basics of visual communication and interaction design, focusing on communicating designs of interactive systems. Covers techniques from a breadth of visual communication traditions; how to choose, use, and innovate; and how to structure dialogue around them.

ARTG 80H - Critical History of Digital Games (5)

Surveys the history of digital games from open university games through the home console, PC, and contemporary platforms, and on to indie and art games. Throughout, the course locates connections between technology, marketing, and play culture. (Formerly History of Digital Games.)

ARTG 80I - Foundations of Play (5)

Understanding the foundations of play through reading influential texts; in-class lectures and activities; designing and playtesting games; and the ethnographies of players in the physical world.

ARTG 91 - Introduction to Game Art Production (5)

Project-centered studio-lecture hybrid course that introduces the process of world-building and interaction design from the standpoint of the art director. Each project addresses a milestone in the art direction development pipeline, and demonstrates corresponding entry-level technical and conceptual skills and strategies. Utilizing this split methodology, the big-picture game development process is presented in tandem with related fundamental digital art and design skills at an achievable scale for an introductory course.

Upper-Division

ARTG 118 - Character Creation for Video Games (5)

This is a hands-on studio course, intended to give students an understanding of the techniques used to create characters for use in video games. Through this course, students will understand and develop the skills necessary to take a video game character design through all of the stages necessary to have a finished character for use in 2D or 3D video games. You will learn industry tools and techniques to be an effective game artist. (Formerly, Digital Drawing/Painting for Game Design.)

Prerequisite: Enrollment is restricted to junior and senior art and design: games and playable media majors and proposed majors.

ARTG 120 - Game Design Experience (5)

Teaches the concrete skills associated with making a digital game, from start to finish. Activities include establishing a team, concepting, storyboarding, prototyping, producing, and testing a game for release. Students are organized into groups and work together to create and produce a playable game.

Prerequisite: Prerequisite(s): ARTG 80G or ARTG 80H or ARTG 80I; and CMPM 80K; and FILM 80V; and CSE 30 or CSE 15 and CSE 15L or CMPM 35. Concurrent enrollment in CMPM 120 is required. Enrollment is restricted to juniors and seniors. Corequisite: Concurrent enrollment in CMPM 120 is required. .

ARTG 129 - Special Topics in Game Design (5)

Allows students to explore game designs related to their ongoing work within their major in either digital or non-digital formats. Students choose a topic and develop game projects that engage players.

Prerequisite: Prerequisite(s): Two of the following courses: ARTG 80G, ARTG 80H, ARTG 80I. Enrollment is restricted to art & design: games and playable media and computer science:computer game design majors.

ARTG 129A - Special Topics in Game Design (5)

Gives students an opportunity to explore game designs related to their ongoing work within the AGPM major, in either digital or analog formats. Students develop projects that engage players on a topic of their choosing.

Prerequisite: Prerequisite(s): ARTG 80G, ARTG 80H, and ARTG 80I. Enrollment is restricted to art and design: games and playable media and computer science: games and playable media majors.

ARTG 131 - 3D Game Art Production (5)

Studio course in which students learn the highly technical and fundamental skills in the production of 3D art assets for video games. Covers the essential steps in the 3D art pipeline, starting with basic 3D modeling, UV unwrapping, the creation of texture maps, and finally, game engine implementation. Focuses on developing an understanding of the processes and creative thinking necessary to produce industry-level artwork rather than specific software. Students provided with video lectures and demos, and students can expect to produce weekly assignments to practice basic skills and concepts covered.

ARTG 132 - 3D Character Rigging and Animation for Video Games (5)

Gives students an in-depth understanding of the techniques of 3D character rigging and animation for video games. Students understand and develop the skills necessary to be an effective technical artist and animator with a focus on industry standard methods for animating characters to be implemented into a game engine. Course provides students with video and written lectures, video demonstrations, assignments and discussion boards aimed at giving them historical understanding of game animation, the evolution of these techniques, hands-on work to become proficient, as well as the ability to communicate online with other students and the instructor to answer questions and further their knowledge.

ARTG 134 - Spectacular Play: Performance, Ritual, and Making a Scene IRL (5)

What do immersion and interactivity look like outside of virtual worlds? How can we activate social dynamics and public space for the purpose of play? How might we evoke feelings of purpose, or even magic, for players and spectators alike? Students will study and create immersive experiences designed to play out in real life. Drawing inspiration from performance studies, activism, art history, and more, we will transform the everyday into the extraordinary.

Prerequisite: Two of the following courses: ARTG 80G, ARTG 80H, ARTG 80I.

ARTG 136 - Digital Sculpting for Video Games (5)

In this studio course, students learn the basics of digital sculpting in ZBrush with a focus on 3D character art. Through a mix of in-class demos and periodic assignments, students learn how to produce high-fidelity digital sculpts and their practical application in the 3D game art pipeline.

ARTG 137 - Experimental Tabletop RPG Design (5)

Explores experimental mechanics, dynamics, themes, and aesthetics within the tabletop RPG form. In groups and individually, students will play, run, design, write, workshop, and print/produce experimental tabletop RPGs, as well as conduct usability tests focused on layout, design cohesion, and accessibility.

Prerequisite: Prerequisite(s): ARTG 80G, ARTG 80H, and ARTG 80I.

ARTG 138 - Feminist Games (5)

Feminist games including intersectional feminist games, transfeminist games and queer feminist games, will be created by students in this course. Students will study the existing history and present of these genres of games, including game mods, personal experience games, narrative games, alternate reality, augmented reality and electronic literature. Students will work individually to create games as art and activism building on critical theories of race, gender, sexuality and algorithms.

Prerequisite: Prerequisite(s): Two courses from the following: ARTG 80G, ARTG 80H, or ARTG 80I.

ARTG 140 - Writing for Interactive Narrative (5)

Discusses a variety of aspects of writing found in videogames and other interactive forms of media. Using a mix of creative writing projects and in class discussions, students will practice and critique existing work as well as their own.

ARTG 141 - Introduction to Virtual Reality (5)

Introduction to Virtual Reality is an introductory course with a combination of theory and practice. Students are exposed to the history of Virtual Reality and hands-on experience in making VR and developing their own VR project. By introducing broad topics around VR, such as immersive spectacle, virtual embodiment, sonic immersiveness, students will gain knowledge about cultural, historical, and practical perspectives of VR. Students will also learn technical skills in developing VR in Unity 3D. 3D modeling experience is not required in this class. This class is an integration of the production of 3D and 360 degree VR experience. Photogrammetry, 360 degree video production and editing, and other expressive media will also be introduced for advancing the development of VR.

ARTG 145 - Non-Digital Game Design (5)

Looks specifically at the design of non-digital games. Surveys a variety of game types and designs. Students prototype card or board game, culminating in a final project that engages players on a socially relevant topic.

ARTG 170 - Game Design Studio I (5)

Students create novel, interesting game concepts and outline and polish a game pitch for their yearlong project, starting with concept ideation and storyboarding to prototyping and presenting the game idea. This course is part one of the art and design: games and playable media capstone requirement.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements and ARTG 120 and CPM 120. Enrollment restricted to senior art and design: games and playable media majors.

ARTG 171 - Game Design Studio II (7)

Students craft the core loop of their yearlong game project. Students build the game, examine player feedback, and repeat the process to make the game better. This course places particular emphasis on advanced production techniques for working in teams, as well as software engineering practices for software design, software testing, and build management. This course is part two of the art and design, games and playable media capstone requirement.

Prerequisite: Prerequisite(s): ARTG 170. Enrollment is restricted to senior art and design: games and playable media majors.

ARTG 172 - Game Design Studio III (7)

Students scope and polish their final game designs. Students work towards releasing one specific game platform while coordinating across disciplinary boundaries to create and integrate all the necessary code, art, animation, and sound assets for their game. This course is part III of the art and design: games and playable media capstone requirement.

Prerequisite: Prerequisite(s): ARTG 171. Enrollment is restricted to senior art and design: games and playable media majors.

ARTG 176 - Game Design Collaborative (2)

Supports students who are collaborating with the ARTG/CPM 170-series teams on the creation of their capstone game projects. Enrollment is restricted to students who are working with senior game-design project groups, and by permission of the instructor.

ARTG 199 - Tutorial (5)

Individual study in areas approved by sponsoring instructors. Tutorial may not be used to satisfy major requirements. Petition required, approved by instructor and department; petitions available on the program website.

ARTG 199F - Tutorial (2)

Individual study in areas approved by sponsoring instructors. Tutorial may not be used to satisfy major requirements. Petition required, approved by instructor and department; petitions available on the program website.

ASTR - ASTRONOMY AND ASTROPHYSICS

Lower-Division

ASTR 1 - Introduction to the Cosmos (5)

Overview of the main ideas in our current view of the universe and how these ideas originated. Galaxies, quasars, stars, black

holes, and planets. Students cannot receive credit for this course after receiving credit for ASTR 2.

ASTR 2 - Overview of the Universe (5)

An overview of the main ideas in our current view of the universe, and how they originated. Galaxies, quasars, stars, pulsars, and planets. Intended primarily for nonscience majors interested in a one-quarter survey of classical and modern astronomy. Students cannot receive credit for for ASTR 1 after receiving credit for ASTR 2.

ASTR 3 - Introductory Astronomy: Planetary Systems (5)

Properties of the solar system and other planetary systems. Topics include the Sun, solar system exploration, the physical nature of the Earth and the other planets, comets and asteroids, the origin of the solar system, the possibility of life on other worlds, planet formation, and the discovery and characterization of planets beyond the solar system. Intended for nonscience majors. ASTR 3, ASTR 4, and ASTR 5 are independent and may be taken separately or sequentially.

ASTR 4 - Introductory Astronomy: The Stars (5)

Stellar evolution: observed properties of stars, internal structure of stars, stages of a star's life including stellar births, white dwarfs, supernovae, pulsars, neutron stars, and black holes. Planet and constellation identification. Intended for nonscience majors. ASTR 3, ASTR 4, and ASTR 5 are independent and may be taken separately or sequentially.

ASTR 5 - Introductory Astronomy: The Formation and Evolution of the Universe (5)

The universe explained. Fundamental concepts of modern cosmology (Big Bang, dark matter, curved space, black holes, star and galaxy formation), the basic physics underlying them, and their scientific development. Intended for non-science majors. ASTR 3, ASTR 4, and ASTR 5 are independent and may be taken separately.

ASTR 6 - The Space-Age Solar System (5)

Scientific study of the Moon, Earth, Mercury, Venus, and Mars by the space program; history of rocket development; the Apollo program and exploration of the Moon; unmanned spacecraft studies of the terrestrial planets; scientific theories of planetary surfaces and atmospheres. Intended for nonscience majors.

ASTR 7 - Black Holes (5)

Examines the nature of black holes, including their creation and evolution; evidence for their existence from astronomical observations; and the role of black holes in the evolution of the universe. Also examines current ideas about the nature of space, time, and gravity.

ASTR 8 - Exploring the Universe with Astronomical Data (5)

Introduces how we use observational data to learn about stars, galaxies, planets, and cosmology. Covers astronomical data and experimental design and basic physics and statistical

techniques, such as model fitting, regression, significance tests, and error estimation.

ASTR 9A - Introduction to Research in Physics and Astrophysics (2)

Introduction to research for first-year students interested in physics and astrophysics. Students complete projects in small groups with scientists. Introduces techniques for collaboration; science writing; physics careers. Continuing course spanning two quarters. Enrollment is restricted to first-year proposed astrophysics and physics majors and by permission of the instructor.

ASTR 9B - Introduction to Research in Physics and Astrophysics (3)

Introduction to research for first-year students interested in physics and astrophysics. Students complete projects in small groups with scientists. Introduces techniques for collaboration; science writing; physics careers. Continuing course spanning two quarters. Prerequisite(s): ASTR 9A. Enrollment is restricted to first-year proposed applied physics, physics, and physics (astrophysics) majors and by permission of the instructor.

ASTR 10 - From the Big Bang to Planet Earth (5)

Broad scientific overview of the universe, from the Big Bang to planet Earth. Origin and content: Big Bang, dark matter, dark energy, galaxies, black holes, star systems, exoplanets. Solar system and properties of Earth in relation to other planets. Physics of planetary atmospheres and impact of human activity on Earth's climate. Possibility of terraforming and of life beyond the solar system. Fate of Earth, the solar system, and the universe. Active learning class with continuous assessment. Intended for non-science majors. No previous college-level math, physics, or astronomy required.

ASTR 12 - Stars and Stellar Evolution (5)

An introduction to the observational facts and physical theory pertaining to stars. Topics include the observed properties of stars and the physics underlying those properties; stellar atmospheres; stellar structure and evolution. Intended for science majors and qualified non-science majors. Knowledge of high school physics and an understanding of mathematics at the MATH 2 level required.

ASTR 13 - Galaxies, Cosmology, and High Energy Astrophysics (5)

Introduction to modern cosmology and extragalactic astronomy. Topics include the origin of the universe, Big Bang cosmology, expansion of the universe, dark matter and dark energy, properties of galaxies and active galactic nuclei, and very energetic phenomena in our own and other galaxies. Intended for science majors and qualified non-science majors. Knowledge of high school physics and an understanding of mathematics at the MATH 2 level required.

ASTR 15 - Dead Stars and Black Holes (5)

Course is primarily concerned with the structure, formation, and astrophysical manifestations of compact objects, such as white dwarfs, neutron stars, and black holes, and the astronomical

evidence for their existence. Intended for science majors and qualified non-science majors. Knowledge of high school physics and an understanding of mathematics at the MATH 2 level required.

ASTR 16 - Astrobiology: Life in the Universe (5)

Topics include the detection of extrasolar planets, planet formation, stellar evolution and properties of Mars, the exploration of our solar system and the search for life within it, and the evolution of life on Earth. Intended for science majors and qualified non-science majors. Knowledge of high school physics and an understanding of mathematics at the MATH 2 level required.

ASTR 18 - Planets and Planetary Systems (5)

Our solar system and newly discovered planetary systems. Formation and structure of planets, moons, rings, asteroids, comets. Intended for science majors and qualified non-science majors. Knowledge of high school physics and an understanding of mathematics at the MATH 2 level required.

Upper-Division

ASTR 111 - Order-of-Magnitude Astrophysics (5)

Examines the most basic and direct connection between physics and astrophysics in order to derive a better understanding of astrophysical phenomena from first principles to the extent possible.

Prerequisite: Prerequisite(s): MATH 22 or MATH 23A; PHYS 5B or PHYS 6B; and previous or concurrent enrollment in PHYS 102.

ASTR 112 - Physics of Stars (5)

The leading observational facts about stars as interpreted by current theories of stellar structure and evolution. Spectroscopy, abundances of the elements, nucleosynthesis, stellar atmospheres, stellar populations. Final stages of evolution, including white dwarfs, neutron stars, supernovae.

Prerequisite: Prerequisite(s): MATH 22 or MATH 23A, PHYS 5B or PHYS 6B, and PHYS 102.

ASTR 113 - Introduction to Cosmology (5)

Physical examination of our evolving universe: the Big Bang model; simple aspects of general relativity; particle physics in the early universe; production of various background radiations; production of elements; tests of geometry of the universe; dark energy and dark matter; and formation and evolution of galaxies and large-scale structure.

Prerequisite: Prerequisite(s): MATH 22 or MATH 23A, PHYS 5B or PHYS 6B, and PHYS 102.

ASTR 117 - High Energy Astrophysics (5)

Theory and practice of space and ground-based x-ray and gamma-ray astronomical detectors. High-energy emission processes, neutron stars, black holes. Observations of x-ray binaries, pulsars, magnetars, clusters, gamma-ray bursts, the x-

ray background. High-energy cosmic rays. Neutrino and gravitational-wave astronomy.

Prerequisite: Prerequisite(s): MATH 22 or MATH 23A, PHYS 5B or PHYS 6B, and PHYS 102.

ASTR 118 - Physics of Planetary Systems (5)

Determination of the physical properties of the solar system, its individual planets, and extrasolar planetary systems through ground-based and space-based observations, laboratory measurements, and theory. Theories of the origin and evolution of planets and planetary systems.

Prerequisite: Prerequisite(s): MATH 22 or MATH 23A; and PHYS 5B or PHYS 6B.

ASTR 119 - Introduction to Scientific Computing (5)

Introduction to solving scientific problems using computers. A series of simple problems from Earth sciences, physics, and astronomy are solved using a user-friendly scientific programming language (Python/SciPy).

Prerequisite: Prerequisite(s): MATH 11A or MATH 19A or MATH 20A or AM 15A.

ASTR 136 - Advanced Astronomy Laboratory (5)

Introduces the techniques of modern observational astrophysics at optical wavelengths through hands-on experiments and use of remote observatories. Students develop the skills and experience to pursue original research. Course is time-intensive and research-oriented.

Prerequisite: Prerequisite(s): ASTR 119 and PHYS 133. Enrollment is restricted to junior and senior astrophysics majors.

ASTR 192 - Dir Stu Teach (5)

Dir Stu Teach

ASTR 199 - Tutorial (5)

Graduate

ASTR 202 - Astrophysics I (5)

Survey of radiative processes of astrophysical importance from radio waves to gamma rays. The interaction of radiation with matter: radiative transfer, emission, and absorption. Thermal and non-thermal processes, including bremsstrahlung, synchrotron radiation, and Compton scattering. Radiation in plasmas. (Formerly Relative Processes.)

ASTR 204 - Astrophysics II (5)

Explores how physical conditions in astrophysical objects can be diagnosed from their spectra. Discussion topics include how energy flows determine the thermal state of radiating objects and how the physics of radiative transfer can explain the emergent spectral characteristics of stars, accretion disks, Lyman-alpha clouds, and microwave background. (Formerly Astrophysical Flows.)

Prerequisite: Enrollment is restricted to graduate students.

ASTR 205 - Introduction to Astronomical Research and Teaching (5)

Lectures and seminar-style course intended to integrate new graduate students into the department; to introduce students to the research and interests of department faculty; and to expose graduate students to teaching skills and classroom techniques. (Formerly Introduction to Astronomical Research.)

Prerequisite: Enrollment is restricted to graduate students.

ASTR 214 - Special Topics in Galactic and Extragalactic Astronomy (5)

Survey of some principal areas of research on the origin and growth of cosmic structures and galaxies: the dark ages; 21 cm tomography; first galaxies; first stars and seed black holes; reionization and chemical enrichment of the intergalactic medium; the assembly of massive galaxies; quasi-stellar sources; interactions of massive black holes with their environment; extragalactic background radiation; numerical simulations and the nature of the dark matter; the dark halo of the Milky Way.

Prerequisite: Enrollment is restricted to graduate students.

ASTR 220A - Stars and Planets I (5)

Survey of stellar structure and evolution. Physical properties of stellar material. Convective and radiative energy transport. Stellar models and evolutionary tracks through all phases. Brown dwarfs and giant planets. Comparison with observations. (Formerly Stellar Structure and Evolution.)

Prerequisite: Enrollment is restricted to graduate students.

ASTR 222 - Stars and Planets II (5)

Theory and observations of protoplanetary disks. Origin and evolution of the solar nebula. Formation and evolution of the terrestrial planets and the giant planets. (Formerly Planetary Formation and Evolution.)

Prerequisite: Enrollment is restricted to graduate students.

ASTR 225 - High-Energy Astrophysics (5)

High-energy astrophysics and the final stages of stellar evolution: supernovae, binary stars, accretion disks, pulsars; extragalactic radio sources; active galactic nuclei; black holes. (Formerly *Physics of Compact Objects*)

ASTR 230 - Diffuse Matter in Space (5)

Fundamental physical theory of gaseous nebulae and the interstellar medium. Ionization, thermal balance, theory and observation of emission spectra. Interstellar absorption lines, extinction by interstellar dust. Ultraviolet, optical, infrared, and radio spectra of gaseous nebulae.

ASTR 233 - Galaxies and Cosmology I (5)

Survey of modern physical cosmology, including Newtonian cosmology, curved space-times, observational tests of cosmology, the early universe, inflation, nucleosynthesis, dark

matter, and the formation of structure in the universe. (Formerly Physical Cosmology.)

ASTR 234 - Statistical Techniques in Astronomy (5)

Introduces probability and statistics in data analysis with emphasis on astronomical applications. Topics include probability, Bayes' theorem, statistics, error analysis, correlation, hypothesis testing, parameter estimation, surveys, time-series analysis, surface distributions, and image processing. Students learn to identify the appropriate statistical technique to apply to an astronomical problem and develop a portfolio of analytic and computational techniques that they can apply to their own research.

Prerequisite: Enrollment is restricted to graduate students.

ASTR 240A - Galaxies and Cosmology II (5)

Structure and evolutionary histories of nearby galaxies. Stellar populations, galactic dynamics, dark matter, galactic structure and mass distributions. Peculiar galaxies and starbursting galaxies. Structure and content of the Milky Way. Evolution of density perturbations in the early universe. Hierarchical clustering model for galaxy formation and evolution. (Formerly Galactic and Extragalactic Stellar Systems.)

ASTR 257 - Observational Astronomy (5)

Introduction to observational astronomy with a multi-day field trip to Lick Observatory. Students learn the fundamentals of planning and executing observational projects, manipulating and interpreting raw astronomical data with standard tools and algorithms, presenting their observations in a standard written format that is appropriate for publication, and observatory operations and career paths.

Prerequisite: Designed for graduate students; available to qualified undergraduate astrophysics majors by instructor permission.

ASTR 260 - Instrumentation for Astronomy (5)

An introduction to astronomical instrumentation for infrared and visible wavelengths. Topics include instrument requirements imposed by dust, atmosphere, and telescope; optical, mechanical, and structural design principles and components; electronic and software instrument control. Imaging cameras and spectrographs are described. Offered in alternate academic years.

Prerequisite: Enrollment is restricted to graduate students.

ASTR 289 - Adaptive Optics and Its Application (5)

Introduction to adaptive optics and its astronomical applications. Topics include effects of atmospheric turbulence on astronomical images, basic principles of feedback control, wavefront sensors and correctors, laser guide stars, how to analyze and optimize performance of adaptive optics systems, and techniques for utilizing current and future systems for astronomical observations.

Prerequisite: Enrollment is restricted to graduate students.

ASTR 292 - Seminar (0)

Seminar attended by faculty, graduate students, and upper-division undergraduate students.

ASTR 293 - Current Literature in Astrophysics (2)

Training for following daily progress in astrophysical research to keep pace with the rapidly evolving scientific field. Students learn how to select and read interesting papers (that span a wide range of topics) efficiently and how to summarize their key results. Students have an opportunity to practice presentation skills in an informal group discussion setting.

Prerequisite: Enrollment is restricted to graduate students.

ASTR 294 - Pedagogy of Astrophysical Research (5)

Teaches fundamental skills for scientific research in the context of coursework. Course has two branches: an instructor-intensive hands-on research training in an area beyond the thesis; and an instructor-led literature review. The research branch involves short, quarter-long projects with faculty that are designed to introduce skills and concepts broadly applicable to research but within a focused science domain. The literature branch involves short review projects for building expertise in evaluating literature, writing papers, refereeing articles, and reviewing grants and proposals.

Prerequisite: Enrollment is restricted to astronomy and astrophysics graduate students.

ASTR 297A - Independent Study (5)

Independent study or research for graduate students who have not yet begun work on their theses. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

ASTR 297B - Independent Study (10)

Independent study or research for graduate students who have not yet begun work on their theses. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

ASTR 297C - Independent Study (15)

Independent study or research for graduate students who have not yet begun work on their theses. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

ASTR 299A - Thesis Research (5)

ASTR 299B - Thesis Research (10)

ASTR 299C - Thesis Research (15)

BIOC - BIOCHEMISTRY AND MOLECULAR BIOLOGY

Upper-Division

BIOC 100A - Biochemistry and Molecular Biology (5)

Fundamentals of molecular biology, structure and function of nucleic acids, and protein structure. Designed for students

preparing for research careers in biochemistry and molecular biology. Lecture: 3-1/2 hours; discussion: 1-1/4 hours.

Prerequisite: Prerequisite(s): CHEM 8B; and BIOL 20A.

BIOC 100B - Biochemistry and Molecular Biology (5)

Covers principles of protein function from ligand binding and enzyme mechanism, kinetics and regulation to membrane composition and membrane protein function. Lecture: 3-1/2 hours; discussion: 1-1/4 hours.

Prerequisite: Prerequisite(s): BIOC 100A.

BIOC 100C - Biochemistry and Molecular Biology (5)

Biochemistry: intermediary metabolism and bioenergetics. How enzymatically catalyzed reactions are organized and regulated; how energy from molecules is extracted for chemical work. Lecture: 3-1/2 hours; discussion: 1-1/4 hours. (Formerly Biochemistry .)

Prerequisite: Prerequisite(s): BIOC 100B.

BIOC 110L - Advanced Biochemistry Laboratory (5)

An introduction to the major techniques used in the isolation and characterization of biological components. Laboratory: 8 hours; lecture: 1-3/4 hours. Students are billed a materials fee.

Prerequisite: Prerequisite(s): BIOC 100B and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to chemistry majors in the biochemistry concentration. Other majors by permission.

BIOC 163A - Quantum Mechanics, Spectroscopy and Molecular Structure for Biochemistry and Molecular Biology (5)

Detailed introduction to molecular quantum mechanics and application of spectroscopic and diffraction techniques to problems involving biological macromolecules. Designed as an alternative to CHEM 163A for the biochemistry and molecular biology major requirement. Students cannot receive credit for this course and CHEM 163A.

Prerequisite: Prerequisite(s): CHEM 1B and CHEM 1C; and PHYS 5A, and PHYS 5B, or PHYS 6A and PHYS 6B; and previous or concurrent enrollment in PHYS 5C or PHYS 6C.

BIOC 163B - Biochemical Thermodynamics and Statistical Mechanics for Biochemistry and Molecular Biology (5)

Detailed introduction to the fundamentals of classical and statistical thermodynamics and applications to problems involving biochemical equilibria, macromolecular structure and function. Course is designed as an alternative to CHEM 163B for partial fulfillment of the biochemistry and molecular biology major physical chemistry requirement. Students cannot receive credit for this course and CHEM 163B.

Prerequisite: Prerequisite(s): CHEM 1B and CHEM 1C; PHYS 6A or PHYS 5A; and previous or concurrent enrollment in BIOC 100A. .

BIOE - BIOLOGY ECOLOGY AND

EVOLUTIONARY

Lower-Division

BIOE 16 - Introduction to Horticulture (2)

Surveys the production of indoor crops and landscape plants to gain a working knowledge of how light, temperature, water, fertilizers, and soilless media interact in a controlled environment. Also covers pest management and propagation. Lectures and demonstrations are combined with activities in the UCSC Greenhouses and at the UCSC Arboretum to give students direct experience with horticulture practices and principles in controlled environments. The approach is to develop practical skills and familiarity with agricultural technology while mastering basic principles in plant biology. Emphasis is placed on indoor growth systems.

BIOE 19 - Biodiversity in the Age of Humans (5)

How can we better understand how humans have affected Earth and its inhabitants? Explores how DNA shed by organisms into the environment can be collected and used to study Earth's biodiversity, with applications in medicine, anthropology, agriculture, and conservation.

Prerequisite: Enrollment is restricted to first-year students, sophomores, and juniors.

BIOE 20B - Development and Physiology (5)

Topics in morphology, physiology, development, genetics, and endocrinology selected to exemplify current issues and perspectives in organismic biology.

Prerequisite: Prerequisite(s): BIOL 20A.

BIOE 20C - Ecology and Evolution (5)

Introduction to ecology and evolution covering principles of evolution at the molecular, organismal, and population levels. Evolutionary topics include genetic and phenotypic variation, natural selection, adaptation, speciation, and macroevolution. Also covers behavioral, population, and community ecology including applied ecological issues.

BIOE 75 - Scientific Diving Certification (2)

Prerequisite for course 161/L, *Kelp Forest Ecology*, and all research diving performed under the auspices of UCSC or other academic institutions. Course work includes lectures and scuba diving. Topics include subtidal sampling techniques, navigation, low visibility diving, search and recovery, rescues, small boat use, oxygen administration for divers, technical blue water deep diving, physics, and physiology. Apply online at <http://www2.ucsc.edu/sci-diving>. Students are billed a course materials fee that covers costs for equipment use, materials, and transportation. Prerequisite(s): skill level equal to Advanced Scuba Diver Certification, pass scuba physical, provide own scuba gear, be certified in CPR and First Aid; and interview: pass swim test and scuba skills test.

BIOE 80S - Lies, Damn Lies, and Statistics (5)

Probability and statistics underlie much of our everyday experience and, as such, there is a fundamental need for an understanding of the use, and misuse, of statistics. This course is taught through case studies based in biology, politics, economics, crime, education, disease, conservation, and other fields of interest. For example, does a change in crime rate really affect your probability of being a victim of a crime? The goal is to provide all students with sufficient understanding probability and statistics to determine if everyday and often sensationalistic reporting of statistical results is meaningful.

BIOE 82 - Introduction to Field Research and Conservation (2)

A field-based course with overnight and day trips to regionally diverse areas throughout Central California. Field trips and lectures familiarize students with a wide variety of topics in the ecological, conservation, and environmental science as well as natural-resource management. Enrollment is by instructor permission. Students are billed a materials fee.

BIOE 85 - Natural History of the UCSC Natural Reserves (5)

Lectures and field trips familiarize students with the flora and fauna of the UCSC Natural Reserves. Field trips focus on surveying and identifying vertebrates and plants at each UCSC Natural Reserve (Fort Ord, Campus Reserve, Big Creek, Younger Lagoon, and Ano Nuevo).

BIOE 95 - Seymour Center Docent Training (2)

Taught as a series of seminars, course provides a survey of marine sciences and the role of scientific research in understanding and conserving the world's oceans. Topics include: marine biology, ecology, conservation, coastal geology, and climate change. This series is intended to prepare students to interpret research and inform the public by leading tours at the Seymour Marine Discovery Center at the Long Marine Lab. Enrollment is by application and interview.

BIOE 99 - Tutorial (5)

Individual, directed study for undergraduates. Students submit petition to sponsoring agency.

Upper-Division**BIOE 107 - Ecology (5)**

Focuses on physiological, behavioral, and population ecology, and on linking ecological processes to evolution. It includes basic principles, experimental approaches, concepts of modeling, and applications to ecological problems.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; BIOL 20A, BIOE 20B, and BIOE 20C.

BIOE 108 - Marine Ecology (5)

Paradigms and designs in marine ecology. A review of the paradigms that have shaped our understanding of marine ecology; analysis and discussion of experiments with these

paradigms. Students cannot receive credit for this course and BIOE 208.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; BIOL 20A, BIOE 20B, and BIOE 20C; BIOE 107 or BIOE 140 recommended. Enrollment is restricted to juniors and seniors.

BIOE 109 - Evolution (5)

An examination of the history and mechanisms of evolutionary change. Topics include molecular evolution, natural and sexual selection, adaptation, speciation, biogeography, and macroevolution.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; BIOL 20A, BIOE 20B, BIOE 20C, and BIOL 105.

BIOE 112 - Ornithology (5)

Introduction to the evolution, ecology, behavior, and natural history of birds, using exemplary case histories to illustrate key concepts in evolution, ecology, and behavior.

Prerequisite: Prerequisite(s): BIOE 107, BIOE 109, or BIOE 140. Concurrent enrollment in BIOE 112L is required.

BIOE 112L - Ornithology Field Studies (2)

Field trips introduce students to field identification skills and field investigation of census, foraging behavior, migration, social behavior, and communication. Examination of specimens in the laboratory will be used to highlight the diversity and taxonomy of birds. Some field trips may require students to provide their own transportation.

Prerequisite: Prerequisite(s): BIOE 107, BIOE 109, or BIOE 140. Concurrent enrollment in BIOE 112 is required.

BIOE 114 - Herpetology (5)

Lectures introduce students to evolution, development, physiology, behavior, ecology, and life history of reptiles and amphibians. The materials integrate with conceptual and theoretical issues of ecology, evolution, physiology, and behavior.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; BIOE 107, BIOE 109, BIOE 110, or BIOE 140. Concurrent enrollment in BIOE 114L is required.

BIOE 114L - Field Methods in Herpetological Research (2)

Field trips introduce students to natural history, censusing techniques, physiological ecology, and behavioral analysis of reptiles and amphibians. Laboratories introduce students to techniques for analyzing behavior and physiology. Field studies culminate with a group project in a natural setting. Some field trips may be held on weekends due to weather considerations. Some field trips may require students to provide their own transportation, some transportation will be provided by UCSC. Students are billed a materials fee.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; BIOE 107, BIOE 109, BIOE 110, or BIOE 140. Concurrent enrollment in BIOE 114 is required.

BIOE 117 - Systematic Botany of Flowering Plants (5)

An examination of the taxonomy and evolution of flowering plants. Special topics include phylogenetics and cladistics, plant species concepts, and modern methods of systematic research.

Prerequisite: Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C, and satisfaction of the Entry Level Writing and Composition requirements. Must be taken concurrently with BIOE 117L.

BIOE 117L - Systematic Botany of Flowering Plants Laboratory (2)

Weekly laboratory concerned primarily with California flora and plant families. Several field trips.

Prerequisite: Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C. Must be taken concurrently with BIOE 117.

BIOE 118 - Plants and Society: the Biology of Food, Shelter, and Medicine (5)

Introduces plant biology as it affects human society. Topics include the origins of agriculture, the morphology and chemistry of food plants, the material uses of plant products, the biology of medicinal plants, and plant diversity and bioprospecting.

Prerequisite: Prerequisite(s): BIOL 20A and BIOE 20B and BIOE 20C; or ENVS 23 and ENVS 24.

BIOE 120 - Marine Botany (5)

An introduction to the biology of marine algae, fungi, and angiosperms with regard to form and function. Major boreal, temperate, and tropical marine plant communities. Lecture format.

Prerequisite: Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C, and satisfaction of the Entry Level Writing and Composition requirements. Must be taken concurrently with BIOE 120L.

BIOE 120L - Marine Botany Laboratory (2)

One laboratory weekly and several field trips. Focuses on marine algae, fungi, and angiosperms.

Prerequisite: Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C, and satisfaction of the Entry Level Writing and Composition requirements. Must be taken concurrently with BIOE 120.

BIOE 122 - Invertebrate Zoology (5)

An examination of invertebrates and their habitats. Lecture format.

Prerequisite: Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C and satisfaction of the Entry Level Writing and

Composition requirements. Must be taken concurrently with BIOE 122L.

BIOE 122L - Invertebrate Zoology Laboratory (2)

An examination of invertebrates and their habitats. Weekly laboratories or field trips.

Prerequisite: Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C, and satisfaction of the Entry Level Writing and Composition requirements. Must be taken concurrently with BIOE 122.

BIOE 124 - Mammalogy (5)

Introduces the biology of mammals, including their classification, evolution, behavior, reproductive strategies, and general ecology. Examines the diagnostic traits of mammals; provides a survey of the living orders along with their diagnostic features, physiological and behavioral specializations, and adaptations.

Prerequisite: Prerequisite(s): BIOL 20A and BIOE 20B and BIOE 20C. Concurrent enrollment in BIOE 124L is required.

BIOE 124L - Mammalogy Laboratory (2)

Focuses on the identification of mammals and their specific traits. Exercises provide hands-on experience at identifying mammal orders, families, and species. Field trip provides students with field techniques in mammalogy.

Prerequisite: Prerequisite(s): BIOL 20A and BIOE 20B and BIOE 20C. Concurrent enrollment in BIOE 124 is required.

BIOE 125 - Ecosystems of California (5)

A survey of the diversity, structure, and functioning of California's ecosystems through time and the ways they have influenced and responded to human activities and stewardship. Topics include: ecosystem drivers such as climate, soils, and land-use history; human and ecological prehistory; comparative marine, freshwater, and terrestrial ecosystem dynamics; and managed ecosystems such as range, fisheries, and agriculture.

Prerequisite: Prerequisite(s): BIOE 20C. Enrollment is restricted to ecology and evolution, marine biology, plant sciences, and biology B.A. majors.

BIOE 126 - Biology of Large Marine Vertebrates (5)

Broad overview of the ecology, evolution, physiology, and behavior of marine mammals, birds, and turtles, with an emphasis on local Monterey Bay species.

Prerequisite: Prerequisite(s): BIOE 20C.

BIOE 127 - Ichthyology (5)

An introduction to the biology of jawless, cartilaginous, and bony fishes--their classification, evolution, form, physiology, and ecology.

Prerequisite: Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C, and satisfaction of the Entry Level Writing and Composition requirements. Must be taken concurrently with BIOE 127L.

BIOE 127L - Ichthyology Laboratory (2)

One laboratory session a week and several field trips to study the biology of fish.

Prerequisite: Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C, and satisfaction of the Entry Level Writing and Composition requirements. Must be taken concurrently with BIOE 127.

BIOE 128L - Large Marine Vertebrates Field Course (5)

Lectures combined on fieldwork with large marine vertebrates in the laboratory and lectures with large marine vertebrates in the field (Monterey Bay, Ano Nuevo). Fieldwork familiarizes students with research methods, study design, and statistical approaches for research on large marine vertebrates (seals, birds, fish, and sharks). Research includes: animal tracking; physiology; behavior; foraging ecology; and energetics. Students are billed a materials fee. Prerequisite(s): BIOL 20A and BIOE 20B and BIOE 20C, and satisfaction of the Entry Level Writing and Composition requirements.

BIOE 129 - Biology of Marine Mammals (5)

A survey of cetaceans, pinnipeds, sirenians, and sea otters, including natural history, systematics, physiology, behavior, anatomy, and conservation.

Prerequisite: Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C; and satisfaction of the Entry Level Writing and Composition requirements. BIOL 110 is recommended.

BIOE 129L - Biology of Marine Mammals Laboratory (2)

Covers the basics of marine mammal taxonomy, anatomy, and field methods with an emphasis on local field identification and understanding of local species. Will include field trips to Long Marine Lab, Ano Nuevo, and Monterey Bay.

Prerequisite: Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C. Must be taken concurrently with BIOE 129.

BIOE 131 - Animal Physiology (5)

Principles and concepts underlying the function of tissues and organ systems in animals with emphasis on vertebrate systems. Students cannot receive credit for this course and BIOL 130.

Prerequisite: Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C.

BIOE 131L - Animal Physiology Laboratory (2)

Experiments conducted with primary focus on quantitative physiological principles of organ systems and intact organisms. Students cannot receive credit for this course and BIOL 130L.

Prerequisite: Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C. Concurrent enrollment in BIOE 131 is required.

BIOE 133 - Exercise Physiology (5)

An advanced-level course concerning physiological and biochemical processes associated with human performance. Emphasis is on the integration of organ systems for exercise. Topics include metabolism and fuel utilization, cardiovascular

and respiratory dynamics during activity, and the effects of training. Requires a good understanding of basic physiological function and anatomy.

Prerequisite: Prerequisite(s): BIOL 20A, BIOE 20B and BIOE 20C. BIOE 131 is recommended. Concurrent enrollment in BIOE 133L is required.

BIOE 133L - Exercise Physiology Laboratory (2)

An introduction to basic measurement techniques used in assessing the physiological response of humans to exercise. Sessions cover oxygen consumption, respiratory rate, and heart rate monitoring during aerobic and anaerobic activity.

Prerequisite: Prerequisite(s): BIOL 20A, and BIOE 20B and BIOE 20C. BIOE 131 is recommended. Concurrent enrollment in BIOE 133 is required.

BIOE 134 - Comparative Vertebrate Anatomy (5)

Course focuses on vertebrate form and function: an integration of physiology and biomechanics. Topics include: the physiology and biomechanics underlying vertebrate locomotion; vertebrate feeding; and the morphological changes associated with different locomotion and feeding strategies through evolutionary time.

Prerequisite: Prerequisite(s): BIOL 20A and BIOE 20B and BIOE 20C. Concurrent enrollment in BIOE 134L is required.

BIOE 134L - Comparative Vertebrate Anatomy Laboratory (2)

Course focuses on the gross dissections all major clades of vertebrates: development, form, and diversity of organ systems and basic principles of evolution; vertebrate classification; and functional morphology, with emphasis on feeding and locomotion. Anatomical dissections integrated with the associated lecture material focusing on biomechanics, form, and function.

Prerequisite: Prerequisite(s): BIOL 20A and BIOE 20B and BIOE 20C. Concurrent enrollment in BIOE 134 is required.

BIOE 135 - Plant Physiology (5)

Cellular and organismal functions important in the life of green plants.

Prerequisite: Prerequisite(s): BIOL 20A and BIOE 20B and BIOE 20C; concurrent enrollment in BIOE 135L is required.

BIOE 135L - Plant Physiology Laboratory (2)

Weekly laboratory concerning the cellular and organismal functions of green plants.

Prerequisite: Prerequisite(s): BIOL 20A and BIOE 20B and BIOE 20C; concurrent enrollment in BIOE 135.

BIOE 136 - Environmental Physiology (5)

Explores how an organism's physiology interacts with its environment including molecular to whole organism-level processes. How do animals thrive in the most diverse regions of Earth and why are some more vulnerable to change than others?

Prerequisite: Prerequisite(s): BIOL 20A and BIOE 20B and BIOE 20C.

BIOE 137 - Molecular Ecology (5)

This combination lecture/laboratory course explores the use of molecular (DNA and/or protein) data in ecological and conservation research. Topics covered include data collection; marker choice; estimating genetic diversity and population structure; the inference of mating systems; and environmental genomics.

Prerequisite: Prerequisite(s): BIOE 20B and BIOE 20C and BIOL 20A and BIOL 105, and satisfaction of the Entry Level Writing and Composition requirements. Concurrent enrollment in BIOE 137L is required.

BIOE 137L - Molecular Ecology Laboratory (2)

This combination lecture/laboratory course explores the use of molecular (DNA and/or protein) data in ecological and conservation research. Topics covered include data collection; marker choice; estimating genetic diversity and population structure; the inference of mating systems; and environmental genomics.

Prerequisite: Prerequisite(s): BIOE 20B and BIOE 20C and BIOL 20A and BIOL 105. Concurrent enrollment in BIOE 137 is required.

BIOE 138 - Modeling Evolution and Ecology (5)

Introduces students to how mathematical models can be used to ask and answer evolutionary and ecological questions. Methods covered include optimality theory, population genetics, population dynamic models, game theory, and dynamic state-variable models. Students learn to develop their own mathematical models and to use models to make predictions. Statistical methods for combining theory and data are not covered. Class focuses on learning by doing, using in-class activities, weekly problem sets and an independent project. Students cannot receive credit for this course and BIOE 238. Prerequisite(s): BIOE 107, BIOE 109 and by permission of the instructor. (Formerly BIOE 148B, Quantitative Methods in Ecology and Evolution.)

BIOE 139 - Mathematical Modeling and Data Science in Ecology and Evolution (5)

Teaches students how to build mathematical models and fit them to data to answer questions in ecology and evolution. Includes learning to write code in the R programming language to simulate models and perform statistical analyses. Topics include population and evolutionary dynamics, species interactions, and behavior. Students cannot receive credit for this course and BIOE 239. Prerequisite(s): BIOE 107, BIOE 109, and permission of instructor. (Formerly offered as BIOE 148A Quantitative Ecology.)

BIOE 140 - Behavioral Ecology (5)

An introduction to social and reproductive behavior. Emphasis on studies of vertebrates in their natural habitat. Ideas concerning the evolution of social behavior, mating systems, and individual reproductive strategies. Case histories of well-

studied animals that illustrate key principles in courtship and mating, parental behavior, and food-getting behavior.

Prerequisite: Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C.

BIOE 141L - Behavioral Ecology Field Course (5)

A field-based course introducing students to concepts and methods for studying behavioral ecology in nature. Students will conduct observations and field experiments on various local model organisms including elephant seals, hummingbirds, sparrows, lizards, ants, bees, frogs, and salamanders.

Prerequisite: Prerequisite(s): BIOE 107 or BIOE 140 or BIOE 110; and satisfaction of the Entry Level Writing and Composition requirements.

BIOE 142L - Animal Behavior in the Wild (A Virtual Field Course) (5)

Online laboratory course with a remote (not in-person), virtual field component. Students learn about the scientific study of animal behavior from an ecological and evolutionary perspective through lectures, behavior videos, assignments, field observations, digital labs and final research project. The general goal, however, is to develop the ability to observe the natural world, design research, collect and interpret data, and communicate ideas.

Prerequisite: Prerequisites: BIOL 20A, BIOE 20B, and BIOE 20C. Students may benefit from taking BIOE 142L after or concurrently with BIOE 107 or BIOE 140.

BIOE 145 - Plant Ecology (5)

An exploration of the ecology of plant form, function, distribution, abundance, and diversity. Topics include plant adaptations to environmental conditions, life history variation, competition, reproductive ecology, herbivory, and patterns of diversity. Lecture with discussions of original papers and independent field project. Students cannot receive credit for this course and BIOE 245.

Prerequisite: Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C, and satisfaction of the Entry Level Writing and Composition requirements. BIOE 107 is recommended.

BIOE 145L - Field Methods in Plant Ecology (5)

Hands-on exploration of the concepts and techniques of plant ecology. A combination of lab, greenhouse, and field-based exercises (irrespective of weather conditions). Statistical analysis and scientific writing. One required weekend field trip. Students cannot receive credit for this course and BIOE 245L.

Prerequisite: Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C, and satisfaction of the Entry Level Writing and Composition requirements. Concurrent enrollment in BIOE 145 is required. BIOE 107 is recommended.

BIOE 147 - Community Ecology (5)

Develops the major themes of community biology: structure, trophic dynamics, succession, complex interactions among species, herbivory, evolution and coevolution. Uses case

histories of well-studied marine and terrestrial systems. Students cannot receive credit for this course and BIOE 247.

Prerequisite: Prerequisite(s): BIOE 107, BIOE 108, BIOE 145, BIOE 155 or BIOE 159A; or ENVS 24 by permission of instructor.

BIOE 149 - Disease Ecology (5)

Focuses on the ecological and evolutionary processes that drive the transmission of pathogens between hosts; the impact of disease on host populations; and what causes the emergence of an infectious disease. Includes theoretical framework, description of field techniques, and discussion of wildlife and human diseases including malaria, West Nile virus, Lyme disease, HIV, avian influenza (bird flu), Chikungunya, tuberculosis, chytridiomycosis, and Ebola.

Prerequisite: Prerequisite(s): BIOL 20A, and BIOE 20B and BIOE 20C and BIOE 107.

BIOE 150 - Ecological Field Methods (5)

Lectures and laboratory computer exercises designed to familiarize students with research methods, study design, statistical approaches, and analysis tools for ecological research. Students cannot receive credit for this course and ENVS 104A.

Prerequisite: Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C; concurrent enrollment in BIOE 150L is required. BIOE 107, BIOE 108, BIOE 140, or BIOE 147 recommended.

BIOE 150L - Ecological Field Methods Laboratory (5)

Field-oriented course in the study of animal ecology and behavior. Combines overview of methodologies and approaches to field research with practical field studies. Students are billed a materials fee.

Prerequisite: Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C, and satisfaction of the Entry Level Writing and Composition requirements. Concurrent enrollment in BIOE 150 is required. BIOE 107, BIOE 108, BIOE 140, or BIOE 147 recommended.

BIOE 151A - Ecology and Conservation in Practice Supercourse: Ecological Field Methods (5)

An intensive, on-site learning experience in terrestrial field ecology and conservation, using the University of California Natural Reserves and other natural areas. Students study advance concepts in ecology, conservation, and field methods for four weeks, then experience total immersion in field research at the UC Natural Reserves and other natural areas. Lectures, field experiments, writing assignments, and computer exercises familiarize students with research methods, study design, statistical approaches, and analytical tools for ecological research. Students complete and communicate the results of short field projects in ecology, learn the natural history of the flora and fauna of California, and plan and execute a significant, independent field-research study at the end of the quarter. Enrollment is by application. Prerequisite(s): BIOL 20A, BIOE 20B, BIOE 20C or ENVS 23, ENVS 24, ENVS 100; and STAT 7 & STAT 7L (formerly AMS 7 & AMS 7L). Concurrent enrollment in BIOE 151B-BIOE 151C-BIOE 151D

or ENVS 109B-ENVS 109C-ENVS 109D is required. Satisfies the senior exit requirement for biological sciences majors and satisfies the senior exit requirement for environmental studies majors by prior approval. Students cannot receive credit for this course and BIOE 150, BIOE 150L, ENVS 104A or ENVS 196A.

BIOE 151B - Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory (5)

Field-oriented course in ecological research. Combines overview of methodologies and approaches to field research with practical field studies. Students complete field projects in ecology and also learn the natural history of the flora and fauna of California. Students are billed a materials fee. Enrollment is by application. Prerequisite(s): BIOL 20A, BIOE 20B, BIOE 20C or ENVS 23, ENVS 24, ENVS 100; and STAT 7 & STAT 7L (formerly AMS 7 & AMS 7L); satisfaction of the Entry Level Writing and Composition requirements. Concurrent enrollment in BIOE 151A-BIOE 151C-BIOE 151D or ENVS 109A-ENVS 109C-ENVS 109D is required. Satisfies the senior exit requirement for biological sciences majors and satisfies the senior exit requirement for environmental studies majors by prior approval. Students cannot receive credit for this course and BIOE 150, BIOE 150L, ENVS 104A or ENVS 196A.

BIOE 151C - Ecology and Conservation in Practice Supercourse: Functions and Processes of Terrestrial Ecosystems (5)

From lectures and discussion of terrestrial community and ecosystem ecology, students work individually or in small groups to present an idea for a project, review relevant literature, develop a research question/hypothesis, design and perform an experiment, collect and analyze data, and write a report. The instructor evaluates the feasibility of each student's project before it begins. Enrollment is by application. Prerequisite(s): BIOL 20A, BIOE 20B, BIOE 20C or ENVS 23, ENVS 24, ENVS 100; and STAT 7 & STAT 7L (formerly AMS 7 & AMS 7L). Concurrent enrollment in BIOE 151A-BIOE 151B-BIOE 151D or ENVS 109A-ENVS 109B-ENVS 109D is required. Satisfies the senior exit requirement for biological sciences majors and satisfies the senior exit requirement for environmental studies majors by prior approval. Students cannot receive credit for this course and BIOE 150, BIOE 150L, ENVS 104A or ENVS 196A.

BIOE 151D - Ecology and Conservation in Practice Supercourse: Conservation in Practice (4)

Focuses on current issues in environmental and conservation biology and the emerging field methods used to address them. From field-oriented lectures about current issues in environmental and conservation biology, students pursue research project as individuals and small groups to develop hands-on experience with field skills in conservation research and resource management. Enrollment is by application. Prerequisite(s): BIOL 20A, BIOE 20B, BIOE 20C or ENVS 23, ENVS 24, ENVS 100; and STAT 7 & STAT 7L (formerly AMS 7 & AMS 7L). Concurrent enrollment in BIOE 151A-B-C or ENVS 109A-B-C required. Satisfies the senior exit requirement for biological sciences majors and satisfies the senior exit requirement for environmental studies majors by

prior approval. Students cannot receive credit for this course and BIOE 150, BIOE 150L, ENVS 104A or ENVS 196A.

BIOE 153A - Introduction to Arctic Ecology (5)

Field-intensive course comprised of weekly classes in preparation for the field component. Focuses on issues relevant to the ecology of arctic regions including arctic ecology, arctic geology and paleontology, and arctic environmental change. Students are charged a materials fee. Enrollment is by permission of the instructor. Prerequisite(s): BIOL 20A, and BIOE 20B and BIOE 20C; and concurrent enrollment BIOE 153B and BIOE 153C.

BIOE 153B - Arctic Ecology (5)

Field-intensive course focusing on issues relevant to the ecology of the arctic regions. Explores the changing arctic environment through lectures and hands-on research during an 18-day camping trip transecting the subarctic boreal forest to the high Arctic. Enrollment is by permission of the instructor. Prerequisite(s): BIOL 20A, and BIOE 20B and BIOE 20C; and concurrent enrollment BIOE 153A and BIOE 153C.

BIOE 153C - Disciplinary Communication for Biologists (5)

Writing-intensive course focusing on developing skills in scientific communication with an emphasis on communicating issues relevant to the ecology of arctic regions. Communication products are developed during an 18-day camping trip in the Arctic. Enrollment is by permission of the instructor. Prerequisite(s): BIOL 20A, and BIOE 20B and BIOE 20C; and satisfaction of the Entry Level Writing and Composition requirements; and concurrent enrollment BIOE 153A and BIOE 153B.

BIOE 155 - Freshwater Ecology (5)

Provides an overview of the physical, chemical, and biological processes that characterize inland waters such as lakes, streams, rivers, and wetlands. Also addresses relationships between humans and freshwater, and discusses these challenges in conservation.

Prerequisite: Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C.

BIOE 155L - Freshwater Ecology Laboratory (5)

Field and laboratory study of the ecology of freshwater systems including lakes, streams, and estuaries. Students gain experience sampling and identifying freshwater organisms, designing and analyzing ecological experiments, and writing scientific reports. Students are billed a materials fee.

Prerequisite: Prerequisite(s): BIOL 20A, BIOE 20B, BIOE 20C and BIOE 155.

BIOE 158L - Field Methods in Marine Ecology (5)

Supervised individual research projects in experimental marine biology. Students carry out a complete research project, including (1) the formation of hypotheses; (2) the design and implementation of experiments; (3) collection, analysis, and interpretation of data; and (4) write-up of an oral presentation.

Prerequisite: Prerequisite(s): BIOE 108; satisfaction of the Entry Level Writing and Composition requirements.

BIOE 159A - Marine Ecology Field Quarter: Marine Ecology with Laboratory (5)

Total immersion in marine ecology for very motivated students. Students develop a research project during first five weeks on campus and then spend five weeks of immersion in directed research without distraction in isolated locations off campus (past locations include the Gulf of California in Mexico and Moorea in French Polynesia). Not available through University Extension. No other courses may be taken during this quarter. Students must sign a contract agreeing to standards of behavior outlined in the *UCSC Rule Book* and by the instructors. Students are billed a materials, transportation (not airfare), and room and board fee. Paradigms and designs in marine ecology. A review of the paradigms that have shaped our understanding of marine ecology and analysis and discussion of experiments with these paradigms. Students carry out a complete research project, including the formation of hypotheses; the design and implementation of experiments; the collection, analysis, and interpretation of data; and the write-up and oral presentation of results. Admission by interview during previous winter quarter. BIOE 159A, BIOE 159B, BIOE 159C, and BIOE 159D are equivalent to BIOE 127, BIOE 127L, BIOE 108, and BIOE 158L for major requirements. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; BIOE 159A, BIOE 159B, BIOE 159C, and BIOE 159D must be taken concurrently.

BIOE 159B - Marine Ecology Field Quarter: Ichthyology with Laboratory (5)

An introduction to the biology of jawless, cartilaginous, and bony fishes—their classification, evolution, form, physiology, and ecology. Admission by interview during previous winter quarter. BIOE 159A, BIOE 159B, BIOE 159C, and BIOE 159D are equivalent to BIOE 127, BIOE 127L, BIOE 108, and BIOE 158L for major requirements. BIOE 159A, BIOE 159B, BIOE 159C, and BIOE 159D must be taken concurrently.

BIOE 159C - Marine Ecology Field Quarter: Methods in Field Ecology (5)

Students learn quantitative methods for field experiments and surveys. Emphasis will be on marine environments, but there will also be exposure to terrestrial systems. This is the lecture component to BIOE 159D. No text is required for this course; instead, readings from the current literature will be assigned. Students are evaluated on written independent field project proposals and class participation. Admission by interview during previous winter quarter. BIOE 159A, BIOE 159B, BIOE 159C, and BIOE 159D are equivalent to BIOE 127, BIOE 127L, BIOE 108, and BIOE 158L for major requirements. BIOE 159A, BIOE 159B, BIOE 159C, and BIOE 159D must be taken concurrently.

BIOE 159D - Marine Ecology Field Quarter: Methods in Field Ecology Laboratory (5)

This is laboratory portion of BIOE 159C. Students carry out independent field projects under the supervision of course instructors. All work is done during the 5-6 week off-campus

portion of BIOE 159. Students are evaluated on field techniques, the final write-up of their independent field projects, and class participation. Admission by interview during previous winter quarter. BIOE 159A, BIOE 159B, BIOE 159C, and BIOE 159D are equivalent to BIOE 127, BIOE 127L, BIOE 108, and BIOE 158L for major requirements. BIOE 159A, BIOE 159B, BIOE 159C, and BIOE 159D must be taken concurrently.

BIOE 159E - Marine Ecology Field Quarter: Behavioral Ecology (5)

Study of animal behavior from an ecological and evolutionary perspective, using lectures, exercises, discussion, and research experience in the field. Emphasis on marine environments with exposure to extraterrestrial systems and laboratory studies. Focus on how scientists study animal behavior and what has been learned about evolution and ecology and ecology of animal behavior. Admission by interview during previous winter quarter. BIOE 159E is equivalent to BIOE 140 for major requirements. BIOE 159A, BIOE 159B, BIOE 159C, and BIOE 159E must be taken concurrently.

BIOE 159F - Marine Ecology Field Quarter: Global Change Ecology (5)

Engages students in the evolving discipline of global change biology, which examines the relationships between organisms and their environment. Includes discussion of changes in the climate system and other human disturbances, as well as the effects of these changes on biology, from shifts in organismal performance to species distributions and the timing of biological events. Includes discussion and analysis of different lines of evidence for understanding biological responses to global change, including paleoecology, observations, experiments and modeling. Last, this course also focuses on topics in climate literacy and science communication. Admission by interview during previous winter quarter. BIOE 159A, BIOE 159C, BIOE 159D, and BIOE 159F must be taken concurrently.

BIOE 161 - Kelp Forest Ecology (5)

Study of organization of kelp forests as models for examining biological communities. The physical and biotic factors responsible for community organization of kelp forests are explored using original literature and data collected in BIOE 161L. Class meets one full morning each week. Prerequisite(s): by interview only; BIOL 20A, BIOE 20B, and BIOE 20C are required. Students must pass the University Research Diving Certification (contact the diving safety officer, Institute of Marine Sciences, for further information). Enrollment is restricted to seniors. BIOE 161L must be taken concurrently; BIOE 107, BIOE 120 & BIOE 120L, BIOE 122 & BIOE 122L are recommended.

BIOE 161L - Kelp Forest Ecology Laboratory (5)

Fieldwork using SCUBA to quantitatively and qualitatively examine the abundance and distribution of organisms in kelp forests, with additional laboratory work. Culminates with a directed individual research project. Class meets one full morning each week. Students are billed a materials fee. Admission by interview. Prerequisite(s): BIOL 20A, BIOE

20B, and BIOE 20C; satisfaction of the Entry Level Writing and Composition requirements; BIOE 161 must be taken concurrently; BIOE 107, 120/L, 122/L are recommended. Students must pass the University Research Diving Certification (contact the Diving Safety Officer, Institute of Marine Sciences, for further information).

BIOE 163 - Ecology of Reefs, Mangroves, and Seagrasses (5)

Integrated treatment of coral reefs, sea grasses, and mangroves emphasizing interactions and processes through time. Major topics: biological and geological history, biogeography, evolution and ecology of dominant organisms, biodiversity, community and ecosystem ecology, geology, biogeochemistry, global change, human impacts.

Prerequisite: Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C. Concurrent enrollment in BIOE 163L is required.

BIOE 163L - Ecology of Reefs, Mangroves, and Seagrasses Laboratory (2)

An interdisciplinary laboratory exploration of the anatomy, morphology, adaptations, diversity, evolution, and ecology of corals, mangroves, and seagrasses and of their physical, chemical, and geological environments.

Prerequisite: Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C. Concurrent enrollment in BIOE 163 is required.

BIOE 165 - Marine Conservation Biology (5)

Initially undertakes an in-depth comparison of the biology and conservation of marine versus terrestrial ecosystems. With this foundation, course examines marine biodiversity loss resulting from overexploitation, habitat loss, species introduction, and pollution, with particular emphasis on the resulting trophic cascades, biodiversity losses, and climate change. Students cannot receive credit for this course and ENV 120.

Prerequisite: Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C; OCEA 101 recommended.

BIOE 171 - Disciplinary Communication for Biologists (5)

Writing-intensive course focusing on developing skills in scientific communication, with an emphasis on communicating issues relevant to ecologists and evolutionary biologists. Presents the norms and standards of scientific communication spanning multiple genres. Students cannot receive credit for this course and BIOE 271.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, and BIOL 20A, BIOE 20B, and BIOE 20C.

BIOE 172 - Population Genetics (5)

Basic population genetics and selected topics will be covered, including genetics of speciation, tempo and mode of evolution, genetics of social behavior, natural selection in human populations, and the impact of molecular studies on evolutionary theory. Students cannot receive credit for this course and BIOE 272.

Prerequisite: Prerequisite(s): BIOL 20A, BIOE 20B, BIOE 20C, and BIOL 105, and satisfaction of the Entry Level Writing and Composition requirements.

BIOE 182F - Exploring Research in EEB (2)

Provides undergraduate students with exposure to research in the laboratory of an Ecology and Evolutionary Biology (EEB) faculty member, affiliate, or adjunct. Students are not expected to do independent research but rather to assist in laboratory or field research projects under the supervision of the faculty mentor or appointed researcher. Prerequisite(s): Undergraduate research contract on file with the department. If supervised by different faculty or researchers, may be repeated for credit.

BIOE 183L - Undergraduate Research in EEB (3)

Designed to ensure that students are intellectually engaged in the planning or implementation of a supervised or independent research project, achieve a fundamental understanding of implementing the scientific method, and develop their scientific writing and presentation skills. Prerequisite(s): concurrent enrollment in BIOE 183W and an Undergraduate Research Contract on file with the department.

BIOE 183W - Undergraduate Research in EEB--Writing (2)

Working in coordination with an Ecology and Evolutionary Biology (EEB) faculty member, affiliate or adjunct, students develop and write a formal research proposal or report and give a presentation on their research project. Includes weekly class meetings focused on the philosophy of science, basic statistics, library searches, inputting data, creating graphs, and preparing results for publication, posters, and talks.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; and BIOE 107, BIOE 108, or BIOE 109; and an undergraduate research contract on file with the department.

BIOE 186 - Experimental Design and Data Analysis (7)

Students provided with the programming and statistical tools needed to undertake experimental design and data analysis in ecology and evolutionary biology—from data manipulation, exploration, and visualization to interpretation. Lectures and lab practicals provide a primer on: R programming, basic statistics and probability, hypothesis testing, linear regression, analysis of variance, multiple regression, and categorical data analysis. Students cannot receive credit for this course and BIOE 286. Enrollment is restricted to sophomore, junior, and senior biology, ecology and evolution, plant sciences, and marine biology majors and by permission of the instructor.

BIOE 193 - Independent Research in EEB (5)

Continued undergraduate research on a project sponsored by an Ecology and Evolutionary Biology (EEB) faculty member, affiliate, or adjunct. Students are graded on the quality of their research and meeting the terms of their undergraduate research contract. Prerequisites: course 183W and an undergraduate research contract on file with the department.

BIOE 193F - Independent Research in EEB (2)

Continued undergraduate research on a project sponsored by an Ecology and Evolutionary Biology (EEB) faculty member, affiliate, or adjunct. Students are graded on the quality of their research and meeting the terms of their undergraduate research contract. Prerequisites: course 183W and an undergraduate research contract on file with the department.

BIOE 195 - Senior Thesis (5)

An individually supervised course, with emphasis on independent research. Students required to submit a senior thesis. Enrollment is restricted to majors in biology, ecology and evolution, marine biology, plant sciences, and the combined major with environmental studies. Students submit petition to sponsoring agency.

BIOE 198F - Independent Field Study (2)

Provides for two credits of independent field study (a) by means other than the usual supervision in person, or (b) when the student is doing all or most of the coursework off campus. Students submit petition to sponsoring agency.

BIOE 199 - Tutorial (5)

Reading, discussion, written reports, and laboratory research on selected biological topics, using facilities normally available on campus. Students submit petition to sponsoring agency.

BIOE 199F - Tutorial (2)

Two-credit Tutorial. Reading, discussion, written reports, and laboratory research on selected biological topics, using facilities normally available on campus. Students submit petition to sponsoring agency.

Graduate

BIOE 200A - Scientific Skills (5)

Exposes graduate students to teaching skills, understanding the scientific method, searching and organizing literature, grant proposal and scientific writing, data management and presentation, and scientific speaking. Students are evaluated on their participation and the quality of a written research proposal.

Prerequisite: Enrollment is restricted to graduate students.

BIOE 200B - Advanced Organismal Biology (5)

Consists of lectures focusing on pivotal topics in ecology and evolution. Relevant background material is developed followed by a critical analysis of readings from the primary literature. Designed to give graduate (and advanced undergraduate) students direct contact with the major areas of research that are currently at the forefront of organismal biology.

Prerequisite: Enrollment is restricted to graduate students.

BIOE 203 - Introductory Seminar in Ecology and Evolutionary Biology (3)

Introduction to high-level analysis and discussion of published research papers in theoretical or applied ecology and

evolutionary biology. Course consists of weekly meetings with extensive independent work outside of class. Course is required for all first-year graduate students and forms part of the graduate core curriculum. (Formerly offered as BIOE 293, Readings in Ecology and Evolution.)

Prerequisite: Enrollment is restricted to graduate students or by permission of instructor.

BIOE 208 - Marine Ecology (5)

Paradigms and designs in marine ecology. A review of the paradigms that have shaped our understanding of marine ecology; analysis and discussion of experiments with these paradigms. Students cannot receive credit for this course and BIOE 108.

Prerequisite: Enrollment is restricted to graduate students.

BIOE 215 - Advanced Seminar in Ecology and Evolutionary Biology (3)

Intensive exploration of an advanced topic in theoretical or applied evolutionary biology, ecology, physiology, behavior, or conservation biology. Course consists of weekly meetings with extensive independent work outside of class, resulting in mastery of an area of innovation in the field, or in a comprehensive familiarity with an important body of work. Independent work generally culminates in independent or group projects and products. Course is targeted at students who already have reached a professional level of expertise in their field and advanced master's students. (Formerly offered as BIOE 295, Advanced Ecology and Evolutionary Biology Seminar.)

Prerequisite: Enrollment is restricted to graduate students, except by special permission.

BIOE 238 - Modeling Evolution and Ecology (5)

Introduces students to how mathematical models can be used to ask and answer evolutionary and ecological questions. Methods covered include optimality theory, population genetics, population dynamic models, game theory, and dynamic state-variable models. Students learn to develop their own mathematical models and to use models to make predictions. Statistical methods for combining theory and data are not covered. This class focuses on learning by doing, using in class activities, weekly problem sets and an independent project. Students cannot receive credit for this course and BIOE 138. Enrollment is restricted to graduate students. Enrollment is by permission of the instructor. (Formerly offered as BIOE 248B, Quantitative Methods in Ecology and Evolution.)

BIOE 239 - Mathematical Modeling and Data Science in Ecology and Evolution (5)

Teaches students how to build mathematical models and fit them to data to answer questions in ecology and evolution. Includes learning to write code in the R programming language to simulate models and perform statistical analyses. Topics include: population and evolutionary dynamics; species interactions; and behavior. Students cannot receive credit for this course and BIOE 139. (Formerly BIOE 248A, Quantitative Ecology.)

Prerequisite: Enrollment is restricted to graduate students.

BIOE 245 - Plant Ecology (5)

An exploration of the ecology of plant form, function, distribution, abundance, and diversity. Topics include plant adaptations to environmental conditions, life history variation, competition, reproductive ecology, herbivory, and patterns of diversity. Lecture with discussions of original papers and independent field project. Students cannot receive credit for this course and BIOE 145.

Prerequisite: Prerequisite(s): BIOE 107 or ENVS 24 or permission of instructor. Enrollment is restricted to graduate students.

BIOE 245L - Field Methods in Plant Ecology Laboratory (5)

Hands-on exploration of the concepts and techniques of plant ecology. A combination of lab, greenhouse, and field-based exercises (irrespective of weather conditions), statistical analysis, and scientific writing. One required weekend field trip. Students cannot receive credit for this course and BIOE 145L.

Prerequisite: Enrollment is restricted to graduate students.

BIOE 247 - Community Ecology (5)

Develops the major themes of community ecology: structure, trophic dynamics, succession, complex interactions among species, herbivory, evolution, and coevolution. Uses case histories of well-studied marine and terrestrial systems. Students cannot receive credit for this course and BIOE 147.

Prerequisite: Enrollment is restricted to graduate students.

BIOE 258L - Experimental Marine Ecology (5)

Supervised individual research projects in experimental marine biology. Students carry out a complete research project, including (1) the formation of hypotheses, (2) the design and implementation of experiments, (3) collection, analysis, and interpretation of data, and (4) the write-up of an oral presentation. Prerequisite(s): BIOE 208; and interview to assess ability to carry out field project.

BIOE 262 - Facilitating Change in Coastal Science Policy (5)

Skills-based course in effective leadership and communication, including stakeholder engagement, facilitation, conflict resolution, team building, and introduction to project management. Communication training includes identifying audiences and objectives (public, philanthropy, policymakers, managers, scientist practitioners) and leveraging non-traditional communication platforms. Enrollment is by application and restricted to graduate students.

BIOE 271 - Disciplinary Communication for Biologists (5)

Writing-intensive course focusing on developing skills in scientific communication, with an emphasis on communicating issues relevant to ecologists and evolutionary biologists. This course presents the norms and standards of scientific communication spanning multiple genres. Students cannot receive credit for this course and BIOE 171.

Prerequisite: Enrollment is restricted to graduate students.

BIOE 272 - Population Genetics (5)

Basic population genetics and selected topics are covered including genetics of speciation, tempo and mode of evolution, genetics of social behavior, natural selection in human populations, and the impact of molecular studies on evolutionary theory. Students cannot receive credit for this course and BIOL 172.

Prerequisite: Enrollment is restricted to graduate students.

BIOE 279 - Evolutionary Ecology (5)

Analysis of the ways in which ongoing evolution and coevolution shape the ecological structure and dynamics of populations, species, and species interactions across geographic landscapes.

Prerequisite: Enrollment is restricted to graduate students.

BIOE 281A - Topics in Basic and Applied Marine Ecology (2)

Seminar focusing on concepts in basic and applied ecology. Structure rotates quarterly between graduate student research and readings of journal articles and textbooks.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with permission of instructor.

BIOE 281B - Topics in Molecular Evolution (2)

A discussion of current research and literature review on the subject of molecular evolution. Primary focus on recent results on molecular phylogenetics and molecular population genetics.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with permission of instructor.

BIOE 281C - Topics in Physiological Ecology (2)

An intensive seminar focusing on the interaction between physiological constraint and life history options and solutions employed by animals. Topics vary from comparative physiology to ecological theory. Participants are required to present results of their own research or review papers of interest.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with permission of instructor.

BIOE 281D - Topics in Global Change Ecology (2)

Focuses on fundamental concepts in global-change ecology, with emphasis on coastal and marine ecosystems and issues of sustainability. The seminar is devoted to reading and evaluating current and classic literature and discussing graduate student research.

Prerequisite: Enrollment is restricted to graduate students.

BIOE 281E - Topics in Freshwater Ecology (2)

Current topics in freshwater ecology, eco-evolutionary dynamics, fisheries, and fish ecology.

Prerequisite: Enrollment is restricted to graduate students. Qualified undergraduates may enroll with permission from instructor.

BIOE 281F - Ecological Research Topics (2)

Intensive research and discussions on plant-animal interactions. All students undertake a research project and meet weekly with the faculty sponsor to monitor progress. The group meets weekly to discuss experimental design and analysis, specific problems related to the students' research, relevant research papers, or manuscripts that the group members are writing. Each student gives a formal presentation of research plans or progress each quarter.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with permission of instructor.

BIOE 281G - Topics in Sexual Selection and Social Behavior (2)

Discussion of current topics, research, and methods in sexual selection and social behavior focusing on theoretical and empirical research and links between evolution and ecology. Students present and discuss their research, read and discuss current and classic literature, or read and discuss methods used in the field.

Prerequisite: Enrollment is restricted to graduate students. Qualified undergraduates may enroll by permission of the instructor.

BIOE 281H - Topics in Comparative Marine Physiology (2)

Intensive seminar on selected topics in marine physiology. Students present results from their own research and discuss recent advances from the literature.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with permission of instructor.

BIOE 281I - Topics in Disease Ecology, Population Biology, and Conservation (2)

Selected topics in population biology and disease ecology. Students present results from their own research and discuss recent advances from the literature.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll by permission of instructor.

BIOE 281K - Topics in Plant Evolution (2)

Intensive seminar on selected topics in plant evolution. Students present results from their own research and discuss recent advances from the literature.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll by permission of instructor.

BIOE 281L - Topics in Behavioral and Evolutionary Ecology (2)

An intensive seminar on selected topics in behavioral and evolutionary ecology. Students are expected to discuss the current literature and present literature reviews, research proposals, and preliminary results from their ongoing research.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with permission of instructor.

BIOE 281N - Topics in Marine Vertebrate Ecology (2)

Seminar on the ecology of marine vertebrates. Topics vary from the factors that explain the distribution of marine predators to island biogeography and the ecosystem effects of introduced vertebrates on islands.

Prerequisite: Enrollment is restricted to graduate students.

BIOE 281O - Topics in Plant-Water Relations (2)

Intensive seminar focusing on fundamental and evolutionary concepts in plant-water relations. Students present results from their own research and discuss recent advances from the literature.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll by permission of instructor.

BIOE 281P - Topics in Plant Population Ecology (2)

An intensive seminar on selected topics in plant ecology and population biology. Students present results from their own research and discuss recent advances from the literature.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with permission from instructor.

BIOE 281Q - Topics in Molecular Evolutionary Genetics (2)

An intensive seminar on selected topics in molecular evolutionary genetics. Students are required to present results from their own research projects, present a critical review paper at least once during the quarter, and submit a written research proposal.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduate students may enroll with permission of instructor.

BIOE 281R - Topics in Marine Ecology and Evolutionary Biology (2)

An intensive seminar series focusing on fundamental concepts in marine ecology. Emphasis changes quarter to quarter. At least one quarter per year is devoted to discussion of graduate student research. Other quarters involve reading and evaluating current and classic literature on marine ecology and evolutionary biology.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with permission of instructor.

BIOE 281S - Topics in Ancient DNA and Paleogenomics (2)

Topics in population genetics and genomics, focusing on work involving paleontological and archaeological material. Students present weekly written and oral reports of their research projects. Once each term, students critique a recent publication.

Prerequisite: Enrollment is restricted to graduate students. Qualified undergraduates may enroll with permission from instructor.

BIOE 281T - Species Interactions and Coevolution (2)

The genetics and ecological structure of species interactions, and the role of coevolution between species in shaping biodiversity.

Prerequisite: Enrollment is restricted to graduate students.

BIOE 281U - Topics in Invertebrate Biology (2)

An intensive study about concepts, theory, and techniques for graduate students conducting research on the ecology, genetics, evolution, systematics, or biodiversity of marine invertebrates.

Prerequisite: Enrollment is restricted to graduate students; advanced undergraduates may enroll with permission of instructor.

BIOE 281V - Topics in Behavioral Ecology (2)

A discussion of current topics and methods in behavioral ecology and life history evolution.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with permission of instructor.

BIOE 281W - Topics in Exercise and Environmental Physiology (2)

A weekly seminar discussion on current research and techniques in mammalian exercise and environmental physiology. Areas covered include locomotor physiology, exercise testing and cardiovascular monitoring, and biomechanics. Oral presentation of ongoing research or current literature required from each student.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with permission of instructor.

BIOE 281X - Topics in Behavioral Ecology of Large Marine Vertebrates (2)

Weekly seminar course centering on reading and discussion of selected publications along with peer review of research plans, grant proposals, manuscripts, lectures, and conference presentations. The overarching goal is to support the development and progress of graduate students in the Ecology and Evolutionary Biology Department whose thesis work and interests align with the course topic (reviewing innovative

approaches in marine mammal science, coupling physiological with ecological concepts using integrative tools, identifying ecological and evolutionary context of large marine vertebrate research).

Prerequisite: Enrollment is restricted to ecology and evolutionary biology graduate students; other students may enroll by consent of the instructor.

BIOE 281Z - Conservation Science in a Changing World (2)

Selected readings and guest speakers in conservation, climate science and the ecology of environmental change coupled with peer review of participants' research proposals, grant proposals, manuscripts and scientific presentations.

Prerequisite: Enrollment is restricted to ecology and evolutionary biology graduate students.

BIOE 286 - Experimental Design and Data Analysis (5)

Focuses on problems and designs in ecology and population biology. Topics include experimental design; exploratory data analysis; hands-on statistics; and graphical theory. Structured around a statistical analysis and graphics program to teach students to design surveys and experiments and analyze data. Previous work in statistics strongly recommended.

Prerequisite: Concurrent enrollment in BIOE 286L is required. Enrollment is restricted to graduate students.

BIOE 286L - Experimental Design and Data Analysis Lab (2)

Lab will focus on hands-on statistical problem solving, graphical presentations and experimental design issues.

Prerequisite: Concurrent enrollment in BIOE 286 is required. Enrollment is restricted to graduate students.

BIOE 294 - Ecology, Evolutionary Biology Seminar (0)

Selected topics of current interest to ecologists and evolutionary biologists presented by weekly guest speakers.

Prerequisite: Enrollment is restricted to graduate students.

BIOE 297A - Independent Study (5)

Independent study for graduate students who have not yet settled on a research area for their thesis. Students submit petition to sponsoring agency.

BIOE 297B - Independent Study (10)

Independent study for graduate students who have not yet settled on a research area for their thesis. Students submit petition to sponsoring agency.

BIOE 297C - Independent Study (15)

Independent study for graduate students who have not yet settled on a research area for their thesis. Students submit petition to sponsoring agency.

BIOE 299A - Thesis Research (5)

Students submit petition to sponsoring agency.

BIOE 299B - Thesis Research (10)

Students submit petition to sponsoring agency.

BIOE 299C - Thesis Research (15)

Students submit petition to sponsoring agency.

BIOL - BIOLOGY MOLECULAR CELL AND DEVELOPMENTAL

Lower-Division

BIOL 15 - Undergraduate Research Reports (1)

Undergraduate students who work in faculty research laboratories present the results of their projects. Organized by the Minority Undergraduate Research Program and the Minority Access to Research Careers Program. Designed for students with membership in the above-mentioned programs. Prerequisite(s): qualifications as determined by instructor at first class meeting.

BIOL 20A - Cell and Molecular Biology (5)

Introduction to biochemistry, cell biology, molecular biology, and genetics.

Prerequisite: Prerequisite(s): CHEM 1A; students with a chemistry AP score of 4 or higher who wish to start their biology coursework prior to completing the CHEM 1A, may enroll by permission of the instructor.

BIOL 20L - Experimental Biology Laboratory (2)

Provides biology majors with the theory and practice of experimental biology. A wide range of concepts and techniques used in the modern laboratory are included in the exercises. Designed to satisfy the introductory biology lab requirement of many medical and professional schools.

Prerequisite: Prerequisite(s): BIOL 20A and previous or concurrent enrollment in BIOE 20B.

BIOL 80A - Female Physiology and Gynecology (5)

Biochemical, medical, social, and clinical aspects of the female body. Emphasis will be on biological-chemical interactions in the female organs. Topics include female anatomy, cell physiology, endocrine functions, sexuality and intimacy, sexually transmitted diseases, puberty, pregnancy, menopause, birth control, abortion, immunity, cancer.

BIOL 80E - Evolution (5)

Introduction to Darwinian evolution including how the theory was devised and a discussion of other theories proposed at the time. Explores the facts and evidence of evolutionary processes and the insights they provide in biological diversity, consequences of extinction, and emergence of new diseases. Includes a discussion of evolution and spirituality.

BIOL 80J - Biology of Emerging and Pandemic Diseases (5)

Designed to introduce non-biology majors to the biology of viruses, the human immune system, HIV/AIDS, and emerging viral pandemics. Also explores vaccine technology and viral mediated therapies. Social, political, and economic influences of HIV and other viral pandemics discussed.

BIOL 86 - Research Deconstruction: MCD Biology (3)

Explores scientific principles and logic through research seminars in molecular, cellular, and developmental biology. Additional topics may include diseases, stem cell biology, and other medically relevant areas in biomedical research.

Prerequisite(s): Mathematics 3 or equivalent (i.e., mathematics placement examination score), and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to first-year, sophomore, and junior students. Enrollment is by permission of the instructor.

BIOL 88 - Studies in Medicine: Its Art, History, Science, and Philosophy (5)

An interdisciplinary, multicultural, and historical perspective of medicine focused primarily upon therapy and practice to achieve better understanding of the scope, practice, and limits of medicine.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

Upper-Division**BIOL 100 - Biochemistry (5)**

An introduction to biochemistry including biochemical molecules, protein structure and function, membranes, bioenergetics, and regulation of biosynthesis. Provides students with basic essentials of modern biochemistry and the background needed for upper-division biology courses.

Students who plan to do advanced work in biochemistry and molecular biology should take the Biochemistry and Molecular Biology 100 series directly. Students cannot receive credit for this course after they have completed any two courses from the BIOC 100A, BIOC 100B, and BIOC 100C sequence.

Prerequisite: Prerequisite(s): BIOL 20A and BIOE 20B; and CHEM 8A or CHEM 112A.

BIOL 100L - Biochemistry Laboratory (5)

Basic techniques and principles of laboratory biochemistry including isolation and characterization of a natural product, manipulation of proteins and nucleic acids to demonstrate basic physical and chemical properties; and characterization of enzyme substrate interactions.

Prerequisite: Prerequisite(s): BIOL 100 or BIOC 100A; BIOL 101L or BIOL 102L; and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to declared Biochemistry and Molecular Biology; Biology B.S.; Molecular, Cell and Developmental Biology and Neuroscience majors. Other majors may enroll by permission of the instructor. Students cannot enroll in BIOL 100L after receiving credit with a 'C' or better in BIOL 103L, BIOL 105L, BIOL

106L, BIOL 108L, BIOL 109L, BIOL 115L, BIOL 120L, BIOL 121L, BIOL 129L, BIOL 186L or METX 119L.

BIOL 101 - Molecular Biology (5)

Covers the basic molecular mechanism of DNA replication and transcription, protein synthesis, and gene regulation in bacterial and eukaryotic organisms. The experimental techniques used to determine these mechanisms are emphasized. Unless students have already passed BIOL 20L, they are strongly encouraged to enroll in BIOL 101L.

Prerequisite: Prerequisite(s): BIOL 100 or BIOC 100A.

BIOL 101L - Molecular Biology Laboratory (2)

Laboratory course providing hands-on experience with, and covering conceptual background in, fundamental techniques in molecular biology and biochemistry, including DNA cloning, PCR, restriction digest, gel electrophoresis, protein isolation, protein quantification, protein immunoblot (Western) analysis, and use of online bioinformatics tools.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in BIOL 20L or BIOL 102J, and BIOL 101 or BIOC 100A is required. Students cannot receive credit for this course and BIOL 102L. Enrollment is restricted to biochemistry and molecular biology, biology B.S., molecular, cell, and developmental biology, and neuroscience majors.

BIOL 102J - Toxic RNA Lab I (5)

Introduction to hypothesis-driven laboratory research. Students will create models of a unique uncharacterized disease causing mutation using site directed mutagenesis. An understanding of introductory molecular biology and genetics required. Students are billed a materials fee. Prerequisite(s): BIOL 20A. Enrollment restricted to biological sciences and affiliated majors with sophomore standing or higher. Enrollment by application and permission of instructor.

BIOL 102L - Toxic RNA Lab II (5)

Introduces hypothesis-driven laboratory research. Students create models of a unique uncharacterized disease causing mutation and determine how it impacts the process of pre-mRNA splicing. An understanding of introductory molecular biology and genetics is required. Students are billed a materials fee. Prerequisite(s): BIOL 20A; and BIOL 20L or BIOL 102J. Enrollment is restricted to sophomore, junior, and senior biological sciences and affiliated majors. Enrollment is by application and permission of the instructor.

BIOL 103L - Toxic RNA Lab III (5)

Introduces hypothesis-driven laboratory research. Students create models of a unique, uncharacterized, disease-causing mutation and determine how it impacts the process of pre-mRNA splicing. An understanding of introductory molecular biology and genetics is required. Prerequisite(s): BIOL 102J and BIOL 102L and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to sophomores, juniors, and seniors majoring in biology, molecular, cell, and developmental biology, neuroscience, human biology, and biochemistry and molecular biology.

Enrollment is by application and permission of the instructor. Students cannot enroll in BIOL 103L after receiving credit with a 'C' or better in BIOL 100L, BIOL 105L, BIOL 106L, BIOL 108L, BIOL 109L, BIOL 115L, BIOL 120L, BIOL 129L, BIOL 121L, BIOL 186L or METX 119L.

BIOL 104L - Coronavirus Bioinformatics Lab (2)

The overall objective of this lab is to apply bioinformatic tools to analyze the structure, function, and evolution of SARS-CoV-2 (the virus responsible for the COVID-19 pandemic). Students experience using web-based tools to retrieve and annotate genetic sequences, align sequences from related species, perform phylogenetic analyses, design sequence-based diagnostic protocols, and perform three-dimensional protein structure analyses.

Prerequisite: Prerequisites: BME 105 or BIOL 105; and BIOC 100A or BIOL 100; and BIOL 20L or BIOL 101L. It is assumed that students have minimal level exposure to bioinformatic/sequence analysis tools prior to this course. Students who have taken BME 110 should not enroll in this lab. Enrollment is restricted to biology B.S., biochemistry and molecular biology, human biology, molecular, cell and developmental biology, and neuroscience majors.

BIOL 105 - Genetics (5)

Mendelian and molecular genetics; mechanisms of heredity, mutation, recombination, and gene action.

Prerequisite: Prerequisite(s): BIOL 20A and BIOE 20B.

BIOL 105L - Eukaryotic Genetics Laboratory (5)

Classical and newly developed molecular-genetic techniques used to explore genetic variation in wild populations of the fruit fly *Drosophila melanogaster*. Topics include Mendelian fundamentals, mapping, design of genetic screens, bioinformatic and database analysis, genetic enhancers, and population genetics.

Prerequisite: Prerequisite(s): BIOL 100 or BIOC 100A; BIOL 101L or BIOL 102L; BIOL 105; and satisfaction of the Entry Level Writing and Composition Requirements. Enrollment is restricted to declared Biochemistry and Molecular Biology; Biology B.S.; Molecular, Cell and Developmental Biology and Neuroscience B.S. majors. Other majors may enroll by permission of the instructor. Students may not enroll in BIOL 105L after receiving credit with a 'C' or better in BIOL 100L, BIOL 103L, BIOL 106L, BIOL 108L, BIOL 109L, BIOL 115L, BIOL 120L, BIOL 121L, BIOL 129L, BIOL 186L or METX 119L.

BIOL 106L - Eukaryotic Genetic Engineering (5)

Lab course focusing on teaching students specific molecular genetic methods such as Phenotype analysis, Cloning, PCR, Expression analysis, CRISPR/Cas9-based Gene insertions, Protein Blots, etc., for the genetic manipulation of model organisms.

Prerequisite: Prerequisite(s): BIOL 100 or BIOC 100A; BIOL 101L or BIOL 102L; BIOL 105; and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is

restricted to declared Biochemistry and Molecular Biology; Biology B.S.; Molecular, Cell and Developmental Biology and Neuroscience B.S. majors. Other majors may enroll by permission of the instructor. Students cannot enroll in BIOL 106L after receiving credit with a 'C' or better in BIOL 100L, BIOL 103L, BIOL 105L, BIOL 108L, BIOL 109L, BIOL 115L, BIOL 120L, BIOL 121L, BIOL 129L, BIOL 186L or METX 119L.

BIOL 107J - Synthetic Gene Regulation Lab I (5)

Goal-driven research laboratory. Students collectively formulate a goal and design experiments to achieve their objectives. Students develop molecular tools and use these and other methods to investigate various aspects of gene silencing in eukaryotes. An understanding of introductory molecular biology is required. Prerequisites: CHEM 1B and BIOL 20A. Students who have taken BIOL 102J or BIOL 20L cannot enroll in BIOL 107J. Completion of BIOL 107J is required to enroll in BIOL 107L. Enrollment is by permission and is restricted to sophomores, juniors, and seniors.

BIOL 107L - Synthetic Gene Regulation Lab II (5)

The Synthetic Gene regulation course is a goal-oriented research laboratory. Students are given a project and discuss and design experiments to reach that aim. Students develop molecular tools and use these and other methods to investigate various aspects of gene silencing in eukaryotes. An understanding of introductory biology and genetics is required. Prerequisite(s): BIOL 107J. Completion of BIOL 107L is necessary to enroll in BIOL 108L. Enrollment is by permission of the instructor and is restricted to sophomore, junior, and senior biology B.S., molecular, cell, and developmental biology, biochemistry and molecular biology majors and proposed majors.

BIOL 108L - Synthetic Gene Regulation Lab III (5)

The Synthetic Gene regulation course is a goal-oriented research laboratory. Students will be given a project and will discuss and design experiments to reach that aim. Students will develop molecular tools and will use these and other methods to investigate various aspects of gene silencing in eukaryotes. An understanding of introductory biology and genetics is required. Prerequisite(s): BIOL 107L and satisfaction of the Entry Level Writing and Composition is required. Students cannot enroll in BIOL 108L after receiving credit with a 'C' or better in BIOL 100L, BIOL 103L, BIOL 105L, BIOL 106L, BIOL 109L, BIOL 115L, BIOL 120L, BIOL 121L, BIOL 186L and METX 119L. Enrollment by permission of instructor.

BIOL 109L - Yeast Molecular Genetics Laboratory (5)

Using budding yeast as an experimental organism, this laboratory provides practical experience in classic and modern molecular biology and in genetic and epigenetic methods, and develops strong scientific communication skills. Topics include mendelian genetics, linkage, gene replacement, chromatin immunoprecipitation and epigenetics.

Prerequisite: Prerequisite(s): BIOL 101 or BIOC 100A; and BIOL 101L or BIOL 102L, and BIOL 105. Satisfaction of the Entry Level Writing and Composition requirements. Enrollment

is restricted to declared Biochemistry and Molecular Biology; Biology B.S.; Molecular, Cell and Developmental Biology and Neuroscience B.S. majors. Other majors may enroll by permission of the instructor. Students cannot enroll in BIOL 109L after receiving credit with a 'C' or better in BIOL 100L, BIOL 103L, BIOL 105L, BIOL 106L, BIOL 108L, BIOL 115L, BIOL 120L, BIOL 121L, BIOL 129L, BIOL 186L, and METX 119L.

BIOL 110 - Cell Biology (5)

Covers the structure, organization, and function of eukaryotic cells. Topics include biological membranes, organelles, protein and vesicular trafficking, cellular interactions, the cytoskeleton, and signal transduction. Requires a good understanding of basic biochemistry and molecular biology.

Prerequisite: Prerequisite(s): BIOL 101 or BIOC 100A; and BIOL 105; and BIOL 101L or BIOL 102L or BIOL 20L.

BIOL 111 - Immunology (5)

Immune systems--their manifestations and mechanisms of action.

Prerequisite: Prerequisite(s): BIOL 20A, BIOE 20B, BIOL 105, and BIOL 110.

BIOL 111A - Immunology I (5)

Principles and concepts of the innate and adaptive immune systems, with emphasis on mechanisms of action and molecular and cellular networks. The development, differentiation, and maturation of cells of the immune system are also discussed.

Prerequisite: Prerequisite(s): courses BIOE 20B, BIOL 20A, BIOL 105, and BIOL 110.

BIOL 111B - Immunology II (5)

The immune system in health and disease, including failures of host immune-defense mechanisms, allergy and hypersensitivity, autoimmunity, transplantation biology, the immune response to tumors, immune-system interactions with pathogens, and manipulation of the immune response.

Prerequisite: Prerequisite(s): BIOL 111A.

BIOL 112 - Virology (3)

Principles of virology illustrated through study of specific examples. Topics include: viral genome organization, viral assembly, virus-host interactions, genetic diversity of viruses, viral ecology, and the epidemiology of viral diseases.

Prerequisite(s): BIOL 101 and BIOL 110 and consent of instructor.

BIOL 114 - Cancer Cell Biology (5)

Focuses on the molecular and cellular mechanisms behind cancer. Topics covered include oncogenes, tumor suppressor genes, cell growth genes, checkpoint genes, telomeres, and apoptosis. Students will gain experience in reading the primary scientific literature.

Prerequisite: Prerequisite(s): BIOL 110 or BIOL 115.

BIOL 115 - Eukaryotic Molecular Biology (5)

Covers eukaryotic gene and genome organization; DNA, RNA, and protein synthesis; regulation of gene expression; chromosome structure and organization; and the application of recombinant DNA technology to the study of these topics.

Prerequisite: Prerequisite(s): BIOL 101 or BIOC 100A; and BIOL 105; and BIOL 101L or BIOL 102L. Enrollment restricted to biological sciences and affiliated majors, non-majors by permission of instructor.

BIOL 115L - Eukaryotic Molecular Biology Laboratory (5)

A laboratory designed to provide students with direct training in basic molecular techniques. Each laboratory is a separate module which together builds to allow cloning, isolation, and identification of a nucleic acid sequence from scratch. Students cannot receive credit for this course and BIOL 187L or BIOL 287L. Students are billed a materials fee.

Prerequisite: Prerequisite(s): BIOL 100 or BIOC 100A; BIOL 101L or BIOL 102L; and satisfaction of the Entry Level Writing and Composition Requirements; and previous or concurrent enrollment in BIOL 101 or BIOL 115. Enrollment is restricted to declared Biochemistry and Molecular Biology; Biology B.S.; Molecular, Cell and Developmental Biology and Neuroscience B.S. majors. Other majors may enroll by permission of the instructor. Students cannot enroll in BIOL 115L after receiving credit with a 'C' or better in BIOL 100L, BIOL 103L, BIOL 105L, BIOL 106L, BIOL 108L, BIOL 109L, BIOL 120L, BIOL 121L, BIOL 129L, BIOL 186L or METX 119L.

BIOL 116 - Advanced Topics in Cell Biology (3)

Advanced course in cell biology featuring small-classroom discussion of topics related to the structure and function of cells and their organelles. Emphasis is given to experimental strategies used in cell biology research. Requires discussion of scientific literature and student-led presentations.

Prerequisite: Prerequisite(s): BIOL 110. Enrollment is restricted to senior human biology, molecular, cell, and developmental biology, and neuroscience majors. Other majors by permission of instructor.

BIOL 117 - Global Health and Neglected Diseases (5)

Neglected tropical diseases afflict more than 1 billion of the poorest individuals on the planet. Course covers the molecular basis and pathology of the most prevalent neglected diseases and emerging strategies to combat these diseases.

Prerequisite: Prerequisite(s): BIOL 110. Enrollment is restricted to senior human biology, molecular, cell, and developmental biology, and neuroscience majors. Other majors by permission of instructor.

BIOL 118 - Principles of Human Genetics (5)

Overview of human and medical genetics covering the molecular basis of genetic disease, quantitative methodologies utilized in calculation of genetic risk, and genetic testing and

counseling. Includes discussion of ethical issues in genetics and genomic medicine.

Prerequisite: Prerequisite(s): STAT 5, or STAT 7 and STAT 7L; BIOL 105 or BME 105; and BIOL 101 or BIOL 115. Enrollment is restricted to biology B.S.; human biology; neuroscience; and molecular, cell, and developmental biology majors. Other students may enroll with instructor permission.

BIOL 120 - Developmental Biology (5)

A description and analysis of selected developmental events in the life cycle of animals. Experimental approaches to understanding mechanisms are emphasized.

Prerequisite: Prerequisite(s): BIOL 110.

BIOL 120L - Development Laboratory (5)

Experimental studies of animal development using a variety of locally obtainable organisms. Approximately eight hours weekly, but it will often be necessary to monitor continuing experiments throughout the week.

Prerequisite: Prerequisite(s): BIOL 100 or BIOC 100A; and BIOL 101L or BIOL 102L; satisfaction of the Entry Level Writing and Composition requirements. Previous or concurrent enrollment in BIOL 120 is required. Enrollment is restricted to declared Biochemistry and Molecular Biology; Biology B.S.; Molecular, Cell and Developmental Biology and Neuroscience B.S. majors. Other majors may enroll by permission of the instructor. Students cannot enroll in BIOL 120L after receiving credit with a 'C' or better in BIOL 100L, BIOL 103L, BIOL 105L, BIOL 106L, BIOL 108L, BIOL 109L, BIOL 115L, BIOL 121L, BIOL 129L, BIOL 186L, and METX 119L.

BIOL 121L - Environmental Phage Biology Laboratory (5)

Introduction to hypothesis-driven laboratory research. Students isolate a unique bacteriophage and characterize its structure and genome. An understanding of molecular biology and basic genetics is required. Students are billed a materials fee. Prerequisite(s): BIOL 100 or BIOC 100A; and BIOL 101L or BIOL 102L; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to declared Biochemistry and Molecular Biology; Biology B.S.; Molecular, Cell and Developmental Biology and Neuroscience B.S. majors. Enrollment is by application and permission of instructor. Students cannot enroll in BIOL 121L after receiving credit with a "C" or better in BIOL 100L, BIOL 103L, BIOL 105L, BIOL 106L, BIOL 108L, BIOL 109L, BIOL 115L, BIOL 120L, BIOL 129L, BIOL 186L or METX 119L.

BIOL 124 - Optical Imaging for Biological Research (3)

Covers the theory and application of light microscopy in a non-mathematical way. Course starts with basic optics, introduces the working principles of various microscopes, and discusses recent innovations in imaging techniques with an emphasis on neuroscience applications.

Prerequisite: Prerequisite(s): PHYS 5B or PHYS 6B; and BIOL 110.

BIOL 125 - Introduction to Neuroscience (5)

The structure and function of the nervous system. Topics include elementary electrical principles, biophysics and physiology of single nerve and muscle cells, signal transduction at synapses, development of the nervous system, and neural basis of behavior. Requires a good understanding of basic biochemistry, cell biology, and molecular biology.

Prerequisite: Prerequisite(s): BIOL 20A, BIOE 20B; and BIOL 101 or BIOC 100A; previous or concurrent enrollment in BIOL 110 is required.

BIOL 126 - Neural Plasticity and Cognitive Neuroscience (5)

Focuses on the dynamic aspect of the nervous system and how it subserves various cognitive functions. Starting with synaptic plasticity, students explore the neural circuit mechanisms underlying various cognitive functions and how they go astray in neurological disorders. Students cannot receive credit for this course and BIOL 226. (Formerly Advanced Molecular Neuroscience.)

Prerequisite: Prerequisite(s): BIOL 125. Enrollment is restricted to neuroscience majors and proposed majors.

BIOL 127 - Mechanisms of Neurodegenerative Disease (5)

Focuses on cellular and molecular processes that underlie neurodegenerative diseases. Includes lectures, student oral presentations, discussions, a term paper, and exams.

Prerequisite: Prerequisite(s): BIOL 110.

BIOL 128 - Developmental Neurobiology (5)

Covers the principles of nervous-system development from the molecular control of development, cell-cell interactions, to the role of experience in influencing brain structure and function. Students cannot receive credit for this course and BIOL 228.

Prerequisite: Prerequisite(s): BIOL 110 and BIOL 125. Enrollment is restricted to juniors and seniors.

BIOL 129A - Advanced Topics in System Neuroscience (5)

Covers the principles and applications of a wide spectrum of modern approaches in systems neuroscience. Students read and analyze the original literature describing these techniques and exemplary works that utilize the techniques to address important neurobiological questions.

Prerequisite: Prerequisite(s): BIOL 126, BIOL 129L; students cannot enroll in BIOL 129A after receiving credit with a 'C' or better in BIOL 129B. Enrollment is restricted to seniors and graduate students.

BIOL 129B - Advanced Topics in Developmental Neurobiology (5)

Covers current research topics and methods in the field of developmental neurobiology. Students read, analyze, and discuss original research articles related to the development of the nervous system. Intended for upper-level undergraduate students majoring in neuroscience.

Prerequisite: Prerequisite(s): BIOL 105, BIOL 125 and BIOL 128; students cannot enroll in BIOL 129B after receiving credit with a 'C' or better in BIOL 129A. Enrollment is restricted to seniors.

BIOL 129L - Neurobiology Lab (5)

Laboratory course giving students experience with electrophysiological, molecular, microscopic, and behavioral techniques used to analyze the function of nervous systems. Students gain experience with collecting and analyzing neurobiological data and presenting their results in written, oral, and visual presentation formats. Students also learn to critically read and analyze primary literature in neurobiology and to use the knowledge they gain to develop their own research proposal.

Prerequisite: Prerequisite(s): BIOL 101; BIOL 125; and STAT 5 or STAT 7 and STAT 7L. Satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to declared Neuroscience B.S. majors. Other majors may enroll by permission of the instructor. Students cannot enroll in BIOL 129L after receiving credit with a 'C' or better in BIOL 100L, BIOL 103L, BIOL 105L, BIOL 106L, BIOL 108L, BIOL 109L, BIOL 115L, BIOL 120L, BIOL 121L, BIOL 186L and METX 119L.

BIOL 130 - Human Physiology (5)

Function, organization, and regulation of the major organ systems of humans, with emphasis on integration among systems. Students cannot receive credit for this course and BIOE 131.

Prerequisite: Prerequisite(s): BIOL 110.

BIOL 130L - Human Physiology Laboratory (2)

Examines fundamental principles of systemic physiology focusing on the human. Students cannot receive credit for this course and BIOE 131L.

Prerequisite: Prerequisite(s): BIOL 110; BIOL 20L or BIOL 102J; and previous or concurrent enrollment in BIOL 130 is required. Satisfaction of Entry Level Writing and Composition requirements. Enrollment is restricted to biological sciences and affiliated majors; biology minors; other majors by permission.

BIOL 140 - The RNA World (5)

This active-learning course explores the origins, evolution, and functions of ribonucleic acid (RNA), including ribozymes, ribosomes, IRNAs, spliceosomes, riboswitches, messenger RNA, microRNAs, snRNAs, snoRNAs, and other guide RNAs, CRISPR, long noncoding RNAs, retrotransposons, and RNA viruses.

Prerequisite: Prerequisite(s): BIOL 105 or BME 105, and BIOL 101.

BIOL 186F - Undergraduate Research in MCD Biology (2)

Supervised undergraduate research in laboratory of an MCD biology faculty member accompanied by weekly lectures on ethical and practical scientific issues. Topics include: laboratory

safety; the scientific method; the collection, treatment, and presentation of data; critical evaluation of scientific literature; scientific misconduct; and peer review. Career issues, including how to apply for admission to graduate and professional schools, are also discussed. Prerequisite(s): BIOL 100 or BIOC 100A; and BIOL 20L or BIOL 102J; and previous completion of the Disciplinary Communication requirement. Each enrolled student must have a committed MCD faculty sponsor by the first class meeting. Enrollment is restricted to biology and affiliated majors.

BIOL 186L - Undergraduate Research in MCD Biology (5)

Supervised undergraduate research in laboratory of an MCD biology faculty member accompanied by weekly lectures on ethical and practical scientific issues. Topics include: laboratory safety; the scientific method; the collection, treatment, and presentation of data; critical evaluation of scientific literature; scientific misconduct; and peer review. Career issues, including how to apply for admission to graduate and professional schools, are also discussed. Prerequisite(s): Entry Level Writing and Composition requirements; BIOL 100 or BIOC 100A; and BIOL 20L or BIOL 102J. Each enrolled student must have a committed MCD faculty sponsor by the first class meeting. Enrollment is restricted to declared Biochemistry and Molecular Biology; Biology B.S.; Molecular, Cell and Developmental Biology and Neuroscience B.S. majors. Other majors may enroll by permission of the instructor. Students cannot enroll in BIOL 186L after receiving credit with a 'C' or better in BIOL 100L, BIOL 103L, BIOL 105L, BIOL 106L, BIOL 108L, BIOL 109L, BIOL 115L, BIOL 120L, BIOL 121L, BIOL 129L, or METX 119L.

BIOL 186R - Undergraduate Research in MCD Biology (5)

Supervised undergraduate research in the laboratory of an MCD biology faculty member accompanied by weekly lectures on practical scientific issues. Topics include: laboratory safety; the scientific method; the collection, treatment, and presentation of data; critical evaluation of scientific literature; ethics and scientific misconduct; and peer review. Career issues, including how to apply for admission to graduate and professional schools, are discussed. Students cannot receive credit for this course and course 186L. Prerequisite(s): BIOL 100 or BIOC 100A; and BIOL 20L or BIOL 102J; and previous completion of the Disciplinary Communication requirement. Each enrolled student must have a committed MCD faculty sponsor by the first class. Enrollment is restricted to MCD Biology-affiliated majors.

BIOL 188 - A Life in Medicine (3)

Students explore healthcare from the perspectives of both clinicians and patients. The class focuses on medicine's cognitive, emotional, and spiritual elements, with the goal of understanding the rewards and costs of healthcare practice.

Prerequisite: Enrollment is restricted to junior and senior human biology majors, and others by permission of instructor.

BIOL 189 - Health Sciences Internship (3)

Structured off-campus learning experience providing experience and pre-professional mentoring in a variety of

health-related settings. Interns are trained and supervised by a professional at their placement and receive academic guidance from their faculty sponsor. Students spend 8 hours per week at their placement, participate in required class meetings on campus, and keep a reflective journal. Enrollment is by application. Students interview with health sciences internship coordinator; applications are due one quarter in advance to the Health Sciences Internship Office. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; previous or concurrent enrollment in BIOL 189W is required. Enrollment is restricted to human biology majors.

BIOL 189W - Disciplinary Communication: Human Biology (3)

Writing-intensive course offered in conjunction with the health sciences internship. Weekly class meetings include academic guidance and mentoring as well as discussion of the mechanisms and conventions of academic writing about health and health care. Students complete multiple writing assignments, culminating in a term paper in the format of a scholarly article. Enrollment is by application. Students interview with the health-sciences internship coordinator; applications are due one quarter in advance to the Health Care Sciences Internship Office. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Previous or concurrent enrollment in course 189 is required. Enrollment is restricted to human biology majors.

BIOL 195 - Senior Thesis Research (5)

An individually supervised course, with emphasis on independent research, to culminate in a senior thesis. Students submit petition to sponsoring agency.

BIOL 198 - Independent Field Study (5)

Provides for individual programs of study (a) by means other than the usual supervision in person, or (b) when the student is doing all or most of the coursework off campus. With permission of the department, may be repeated for credit, or two or three courses taken concurrently. Students submit petition to sponsoring agency.

BIOL 198F - Independent Field Study (2)

Provides for two credits of independent field study (a) by means other than the usual supervision in person, or (b) when the student is doing all or most of the coursework off campus. Students submit petition to sponsoring agency.

BIOL 199 - Tutorial (5)

Reading, discussion, written reports, and laboratory research on selected biological topics, using facilities normally available on campus. Students submit petition to sponsoring agency.

BIOL 199F - Tutorial (2)

Two-credit Tutorial. Reading, discussion, written reports, and laboratory research on selected biological topics, using facilities normally available on campus. Students submit petition to sponsoring agency.

Graduate

BIOL 200A - Critical Analysis of Scientific Literature (5)

Development of critical thinking skills via discussion of research articles on a broad range of topics. Prepares students to critically evaluate research publications, and improves their ability to organize effective oral presentations and to evaluate the oral presentations of other scientists.

Prerequisite: Enrollment is restricted to graduate students in MCD biology, or by permission of instructor.

BIOL 200B - Advanced Molecular Biology (5)

An in-depth coverage of the structure, function, and synthesis of DNA, RNA, and proteins. Discussion of the roles of macromolecules in the regulation of information in the cell.

Prerequisite: Prerequisite(s): Enrollment is restricted to graduate students.

BIOL 200C - Advanced Cell Biology (5)

An in-depth coverage of topics in cellular and subcellular organization, structure, and function in plants and animals. Emphasis on current research problems.

Prerequisite: Prerequisite(s): BIOL 200B. Enrollment is restricted to graduate students.

BIOL 200D - Developmental Biology (5)

Key topics in developmental biology, including developmental genetics, epigenetics, stem cell biology, and developmental neurobiology. Lectures are accompanied by critical analysis and discussion of recent publications.

Prerequisite: Enrollment is restricted to graduate students in MCD biology, or by permission of instructor.

BIOL 200E - Experimental Design (3)

A multidisciplinary course that focuses on topics to consider when tackling biomedical research questions experimentally. Lectures highlight important issues to take into account, are coupled with group discussions and intensive analysis of primary literature, and involve case studies to practically demonstrate how these considerations might be implemented.

Prerequisite: Concurrent enrollment in BIOL 200A is required.

BIOL 200F - Logic and Approaches to Scientific Discovery (5)

Multidisciplinary course with an emphasis on discussion of approaches and methods involved in the study of biological questions. Lectures focus on current gaps in our knowledge of topics and approaches to test models and hypotheses. Course focuses on current topics in RNA and DNA molecular biology, cell biology, developmental biology, stem cells, neurobiology, and genomics. Lectures coupled with small group discussions and written assignments.

Prerequisite: Prerequisite(s): BIOL 200A. Enrollment is restricted to graduate students.

BIOL 201 - RNA Processing (5)

An advanced graduate-level course on biological aspects of RNA function and processing in eukaryotes. Lectures and discussions will be developed using the current literature.

Prerequisite: Prerequisite(s): BIOL 200B or permission of instructor. Enrollment is restricted to graduate students.

BIOL 203 - Ribosomes and Translation (5)

Covers the field of ribosome research in depth, including the structure and function of ribosomes and the molecular mechanisms of protein synthesis. Begins with historical review of the ribosome field and proceeds to the most recent findings. Focus is on central questions: (1) How is the accuracy of the aminoacyl-tRNA selection determined? (2) What is accommodation? (3) What is the mechanism of peptide bond formation (peptidyl transferase)? (4) What is the mechanism of translocation? (5) What are the mechanistic roles of the ribosome and translation factor EF-G in translocation? (6) To what extent is the mechanism of translation determined by RNA? (7) Why is RNA so well suited for the ribosome? (8) How did translation evolve from an RNA world?

Prerequisite: Prerequisite(s): BIOC 100A, BIOL 200B or permission of instructor. Enrollment is restricted to graduate students.

BIOL 204 - Chromatin (5)

Eukaryotic DNA is complexed with histones to form chromatin. This course focuses on the ways in which chromatin influences and is manipulated to regulate gene expression

Prerequisite: Prerequisite(s): BIOL 105 and BIOL 115; undergrads by permission of instructor. Enrollment is restricted to graduate students.

BIOL 205 - Epigenetics (5)

In-depth coverage of epigenetics focusing on how alterations in chromatin structure and DNA methylation establish and maintain heritable states of gene expression. Lectures are supplemented with critical discussion of recent publications.

Prerequisite: Prerequisite(s): BIOL 105 and BIOL 115, or permission of instructor. Enrollment is restricted to graduate students.

BIOL 206 - Introduction to Stem Cell Biology (5)

Fundamental concepts, experimental approaches, and current advances in stem cell biology, with consideration of key ethical issues. Topics include: self-renewal and differentiation; the microenvironment; epigenetics; cell-cycle regulation; and how basic research translates to medical therapeutics. Ethical, moral, and political issues surrounding stem cell research are discussed with lectures from philosophy and other relevant disciplines.

Prerequisite: Enrollment is restricted to graduate students.

BIOL 206L - Current Protocols in Stem Cell Biology (5)

Provides students with hands-on experience in embryonic stem cell culture methods.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll by permission of instructor.

BIOL 208 - Cellular Signaling Mechanisms (5)

All eukaryotic cells utilize intricate signaling pathways to control such diverse events as cell-cell communication, cell division, and changes in cell morphology. This course covers the molecular basis of these cellular signaling pathways, focusing on the most current research.

Prerequisite: Prerequisite(s): BIOL 105, BIOL 110, and BIOL 115. Enrollment is restricted to seniors and graduate students.

BIOL 214 - Advances in Cancer Biology (5)

Provides students with knowledge of the latest concepts in cancer biology and cancer therapeutics, and a general appreciation of the rapid advances being made in this area of biomedicine.

Prerequisite: Prerequisite(s): BIOL 200B or by permission of instructor. Enrollment is restricted to graduate students.

BIOL 215 - Applied Statistics for Molecular, Cell, and Developmental Biology (5)

For experimental biologists: focuses on resolving practical statistical issues typically encountered in molecular, cellular, and developmental biology lab research. No prior experience in statistics or programming is necessary.

Prerequisite: Enrollment is restricted to graduate students in molecular, cellular, and developmental biology.

BIOL 217 - Influence of Environment and Experience on Brain Development (5)

How environmental factors (animals' experiences, environmental toxins, etc.) affect the formation of neuronal circuits and brain function. Lectures and discussions use current literature.

Prerequisite: Prerequisite(s): BIOL 200A, BIOL 200B, BIOL 200C, and BIOL 200D, or by permission of the instructor. Enrollment is restricted to graduate students.

BIOL 218 - CRISPR/Cas Technologies (5)

Provides an overview of the continually emerging roles for CRISPR in biomedical research. Topics will include an overview of the CRISPR genome defense systems in bacteria, the mechanisms of DNA cleavage and repair, the many uses of CRISPR as a genome editing tool in model organisms, and discussions on the ethical use of the technology in precision medicine.

Prerequisite: Prerequisite(s): BIOL 200A, BIOL 200B, and BIOL 200C. Enrollment restricted to graduate students.

BIOL 226 - Advanced Molecular Neuroscience (5)

Basis of neural behavior at the cellular, molecular and system levels. First half of course focuses on cellular, molecular, and developmental aspects of the nervous system and covers two

sensory systems: olfaction and auditory. Last half of course concerns higher-level functions of the nervous system, such as processing and integrating information. Discusses human diseases and disorders. Students cannot receive credit for this course and BIOL 126.

Prerequisite: Enrollment is restricted to graduate students.

BIOL 228 - Developmental Neurobiology (5)

Covers the principles of nervous-system development from the molecular control of development, and cell-cell interactions, to the role of experience in influencing brain structure and function. Students cannot receive credit for this course and course 128. Enrollment is restricted to graduate students and by permission of the instructor.

BIOL 230 - Grant Writing in the Biomedical Sciences (5)

Introduction to the fundamentals of grant writing in biomedical research, including best practices for presentation of data and communication of research findings. Participants write and peer-edit most components of the NIH Ruth Kirschstein F31/F32 pre- or post-doctoral fellowship.

Prerequisite: Enrollment is restricted to graduate students.

BIOL 280A - Topics in Research on Molecular Genetics of Yeast (2)

Intensive research seminar on the structure and function of the gene expression machinery in the simple eukaryote *Saccharomyces cerevisiae* and its relationship to the human gene expression machinery.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with approval of instructor.

BIOL 280B - Chromatin Structure and Transcriptional Regulation (2)

Weekly seminar on structure and gene regulatory function of chromatin. Discusses research of participants and relevant scientific literature.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with permission of instructor.

BIOL 280C - Mammalian Brain Development (2)

Seminar covers research into the development of the mammalian brain.

Prerequisite: Enrollment is restricted to graduate students; undergraduates may enroll with permission of instructor.

BIOL 280D - RNA Processing (2)

A discussion of current research and literature concerning the regulation of precursor messenger RNA processing.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with permission of instructor.

BIOL 280E - Meiotic Chromosome Dynamics (2)

Intensive course on the molecular mechanisms underlying homolog pairing, synapses, and recombination; and how they are regulated, coordinated, and monitored to ensure accurate meiotic chromosome segregation.

Prerequisite: Enrollment is restricted to graduate students; undergraduates may enroll with permission of instructor.

BIOL 280F - Development of Vertebrate Neural Connections (2)

Intensive research seminar on molecular mechanisms by which neural connections are established during mouse development. Special focus on topographic maps and role of Eph receptors and ephrins in this process.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with permission of instructor.

BIOL 280G - Physiology of the Developing Brain (2)

Research seminar covering circuit structure and function in the developing brain.

Prerequisite: Enrollment is restricted to graduate students; undergraduates may enroll by permission of the instructor.

BIOL 280H - Topics on Research into Chromatin and Transcription (2)

Seminar covering research into the effects of chromatin on transcription in yeast.

Prerequisite: Enrollment is restricted to graduate students; undergraduates may enroll with permission of instructor.

BIOL 280I - Epigenetic Gene Silencing and Insulators (2)

Intensive course on molecular mechanisms by which insulator elements regulate epigenetic gene silencing.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with permission of instructor.

BIOL 280J - Structures of Macromolecular Complexes (2)

Focuses on structure and function of the spliceosome using electron microscopy and x-ray crystallography. Participants present results from their own research and relevant journal articles.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with permission of instructor.

BIOL 280K - Topics in Cell Cycle Research (2)

An intensive seminar focusing on current research on the molecular mechanisms that control cell division. Participants are required to present results of their own research or to review journal articles of interest.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with permission of instructor.

BIOL 280L - Development (2)

Seminar covering research into breast development and cancer.

Prerequisite: Enrollment is restricted to graduate students.

BIOL 280M - Post-Transcriptional Control of Mammalian Gene Expression (2)

Intensive course on the molecular mechanisms by which RNA binding proteins regulate gene expression.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with the permission of the instructor.

BIOL 280N - Long Noncoding RNA and the Immune System (2)

Weekly seminar discussion of the current research and literature concerning the functions for long noncoding RNA in gene regulation within inflammatory signaling pathways.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll by permission of the instructor.

BIOL 280P - Quality Control in Gene Expression (2)

Intensive, discussion-based course concerning ongoing research in quality control and gene expression via analysis of published and unpublished observations and theories.

Prerequisite: Enrollment is restricted to graduate students.

BIOL 280Q - Cell Biology of Oocytes, Embryos, and Neurons (2)

Weekly seminar and round-table discussion about research problems and recent advances in molecular motor proteins, cytoskeletons, and the control of force-producing processes. Each participant reports recent advances in their field from current literature, their own primary research questions, current approaches to answering those questions, and their research progress.

Prerequisite: Enrollment is restricted to graduate students; undergraduates may enroll with permission of instructor.

BIOL 280R - Gene regulation in *C. elegans* and human parasitic nematodes (2)

Intense weekly seminar on the mechanisms of gene regulation, focusing on *C. elegans* and human parasitic nematodes.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with the permission of the instructor.

BIOL 280S - Chromatin and RNA Regulation in *C. elegans* (2)

Intensive research seminar about regulators of chromatin organization; the composition and function of germ granules;

and the roles of both levels of regulation in germline development in *C. elegans*. Participants present their research results and report on related journal articles.

Prerequisite: Enrollment is restricted to graduate students; undergraduates may enroll with permission of instructor.

BIOL 280T - Molecular Biology of *Drosophila* Development (2)

An intensive seminar concerning the molecular genetics of *Drosophila*. Recent research is discussed weekly, with an emphasis on gene regulation and development. Students present their own research or critical reviews of recent articles at least once during the quarter.

Prerequisite: Enrollment is restricted to graduate students. Qualified undergraduates may enroll with permission of instructor.

BIOL 280U - Discussions on the Development of the *Drosophila* Embryo (2)

Involves a two-hour weekly meeting in which the students discuss topics concerning the cell cycle, early embryonic development, and the cytoskeleton. These discussions critically evaluate ongoing research in this area. Material is drawn from student research and recently published journal articles. Students are also expected to meet individually with the instructor two hours weekly. In addition to a three-five page research proposal, each student gives two one-hour oral presentations.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with permission of instructor.

BIOL 280V - Translational pediatric genomics (2)

Weekly discussion of the current research and literature on translational pediatric genomics. Specific patient cases may be discussed.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll by permission of the instructor.

BIOL 280W - Development, Connectivity, and Genetic Identity of Neural Circuits (2)

This seminar course will cover the current topics and progress of neuroscience research on neural circuit development, connectivity, function and genetics. (Formerly Membrane Proteins.)

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with permission of instructor.

BIOL 280X - RNA-mediated epigenetic inheritance (2)

Intensive research seminar about epigenetic inheritance and the role of small non-coding RNAs in the intergenerational inheritance of paternal environmental effects. Participants present their research results and report on related journal articles.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll by permission of the instructor.

BIOL 280Y - Activity-Dependent Synaptic Plasticity (2)

Research seminar covering the regulation of synaptic plasticity in the mammalian nervous system, focusing on how the activity regulates the structural and functional dynamics of synapses.

Prerequisite: Enrollment is restricted to graduate students; undergraduates may enroll with permission of instructor.

BIOL 280Z - Prostate Development and Cancer Biology (2)

Weekly research seminar covering gene regulation, cellular interactions, and stem cell behaviors in mammalian prostate development and prostate cancer progression.

Prerequisite: Enrollment is restricted to graduate students; undergraduates may enroll by the permission of the instructor.

BIOL 288 - Pedagogy in STEM (2)

Prepares graduate students to help teach university science courses. Weekly class sessions include activities and interactive discussions of diverse modes of learning, diverse ways of teaching, peer instruction, assessment of learning, equity and inclusion, and professional ethics. Students also visit an active learning class and an active learning discussion section at UCSC, then write evaluations of the teaching strategies used in those classes. (Formerly Teaching Assistant Training.)

Prerequisite: Enrollment is restricted to graduate students.

BIOL 289 - Practice of Science (5)

Examination of ethical and practical scientific issues, including the collection and treatment of data, attribution of credit, plagiarism, fraud, and peer review. Career issues, including how to apply for grants and positions in industry or academia, will be discussed.

Prerequisite: Prerequisite(s): BIOL 200A, BIOL 200B, and BIOL 200C or permission of instructor. Enrollment is restricted to graduate students; undergraduates may enroll with permission of the instructor.

BIOL 290 - Career Planning (2)

An important goal of graduate programs is to train students for diverse careers. Exposes molecular cell and developmental biology graduate students to diverse career options and helps them develop individual development plans to target their graduate training to their selected career goals.

Prerequisite: Enrollment is restricted to graduate students.

BIOL 291 - Molecular, Cellular, and Developmental Biology Seminar (2)

Topics of current interest in molecular, cellular, and developmental biology are presented weekly by graduate students, faculty, and guest speakers.

Prerequisite: Enrollment is restricted to graduate students.

BIOL 292 - MCD Seminar (0)

Various topics by weekly guest speakers.

Prerequisite: Enrollment is restricted to graduate students.

BIOL 296 - Laboratory Research in Molecular, Cell, and Developmental Biology (5)

Independent laboratory research in molecular, cellular, and developmental biology. Students submit petition to sponsoring agency.

BIOL 297A - Independent Study (5)

Independent study for graduate students who have not yet settled on a research area for their thesis. Students submit petition to sponsoring agency.

BIOL 297B - Independent Study (10)

Independent study for graduate students who have not yet settled on a research area for their thesis. Students submit petition to sponsoring agency.

BIOL 297C - Independent Study (15)

Independent study for graduate students who have not yet settled on a research area for their thesis. Students submit petition to sponsoring agency.

BIOL 297F - Independent Study (2)

Independent study for graduate students who have not yet settled on a research area for their thesis. Students submit petition to sponsoring agency.

BIOL 299A - Thesis Research (5)

Students submit petition to sponsoring agency.

BIOL 299B - Thesis Research (10)

Students submit petition to sponsoring agency.

BIOL 299C - Thesis Research (15)

Students submit petition to sponsoring agency.

BIOL 299F - Thesis Research (2)

Students submit petition to sponsoring agency.

Prerequisite: Enrollment is restricted to graduate students.

BME - BIOMOLECULAR ENGINEERING

Lower-Division

BME 5 - Introduction to Biotechnology (5)

Introduces the tools and applications of biotechnology in the fields of medicine, agriculture, the environment, and industry.

BME 18 - Scientific Principles of Life (5)

The principles of life as it exists on this planet and how they generalize. Darwinian evolution, genomes, scientific theories of life (mechanistic, thermodynamic, information theoretic). Future of life: Internet, machine learning and adaptation, artificial intelligence, genome editing, fully artificial life.

BME 21L - Introduction to Basic Laboratory Techniques (3)

Introduces students to basic laboratory techniques that are essential to begin work in faculty research labs and on capstone projects. Students have several independent blocks/fixed projects and learn how to use various instruments and techniques employed in biotechnology laboratories, such as: calibration and use of the pipette; making up various buffers; pH titration; Bacterial transformation; TAcloning; plasmid and DNA isolation; Polymerase Chain Reaction (PCR); gel electrophoresis; Pyrosequencing; and an introduction to Linux for DNA sequence analysis.

Prerequisite: Enrollment is restricted to bioengineering, bioinformatics, and biomolecular engineering and bioinformatics majors and proposed majors.

BME 22L - Foundations of Design and Experimentation in Molecular Biology, Part I (2)

The first in a two-part series that includes BME 23L. Together these courses prepare bioengineering students for successful junior/senior year projects in faculty research laboratories, iGEM, or Senior Design. The focus is on molecular biology laboratory and introductory bioinformatics skills. Students will design and initiate an original metagenome study near the end of the term.

Prerequisite: Prerequisites: BME 21L and CHEM 1A, CHEM 1B, CHEM 1M, and CHEM 1N; or by permission of instructor. Enrollment is restricted to sophomores and juniors.

BME 23L - Foundations of Design and Experimentation in Molecular Biology, Part II (2)

Continuation of BME 22L. Together these courses prepare bioengineering students for successful junior/senior year projects in faculty research laboratories, iGEM, or Senior Design. The focus is on molecular biology laboratory and introductory bioinformatics skills. Students will complete original metagenome and transcriptome studies.

Prerequisite: Prerequisites: BME 22L or by permission of instructor.

BME 51A - Applied Electronics for Bioengineers Part 1 (5)

Lab-based course that introduces measuring, modeling, and designing electronics circuits, emphasizing voltage dividers and complex impedance culminating in simple, negative-feedback op amp circuits for amplifying audio signals.

Prerequisite: Prerequisite(s): MATH 19A; or MATH 11A by consent of instructor. High school physics recommended. Enrollment is restricted to bioengineering and biomolecular engineering & bioinformatics majors and proposed majors; other majors by consent.

BME 51B - Applied Electronics for Bioengineers Part 2 (5)

Lab-based course that introduces designing, measuring, and modeling electronics circuits, emphasizing RC filters and negative-feedback amplifiers for various sensors circuits for amplifying audio signals, design of multi-stage amplifiers, instrumentation amplifiers, and class-D power amplifiers.

Prerequisite: Prerequisite(s): BME 51A.

BME 80G - Bioethics in the 21st Century: Science, Business, and Society (5)

Serves science and non-science majors interested in bioethics. Guest speakers and instructors lead discussions of major ethical questions having arisen from research in genetics, medicine, and industries supported by this knowledge.

BME 80H - The Human Genome (5)

Course will focus on understanding human genes. Accessible to non-science majors. Will cover principles of human inheritance and techniques used in gene analysis. The evolutionary, social, ethical, and legal issues associated with knowledge of the human genome will be discussed.

BME 94 - Group Tutorial (5)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Students submit petition to sponsoring agency.

BME 94F - Group Tutorial (2)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Students submit petition to sponsoring agency.

BME 99 - Tutorial (5)

Students submit petition to sponsoring agency.

BME 99F - Tutorial (2)

Students submit petition to sponsoring agency.

Upper-Division**BME 105 - Genetics in the Genomics Era (5)**

Principles of genetics and genomics focusing on how sequencing technologies enable us to understand gene function, genotype to phenotype relationships, and genetic inheritance.

Prerequisite: Prerequisite(s): BIOL 20A. Enrollment is restricted to bioengineering, biomolecular engineering and bioinformatics, biotechnology, and bioinformatics majors and proposed majors and bioinformatics minors.

BME 110 - Computational Biology Tools (5)

Hands-on lectures and laboratory geared to teach basic tools and skills used in computational biology (genome browsers, sequence database searching, motif analysis, multiple sequence alignment, gene finders, phylogenetics analysis, protein structure visualization, and others). Web-based tools/databases

are used on student laptops. Open to all science students; no prior programming or Unix experience required.

Prerequisite: Prerequisite(s): BME 105, or BIOL 100, or BIOL 105, or BIOC 100A, or CHEM 103, or bioinformatics majors, or biomolecular engineering and bioinformatics majors.

BME 122H - Extreme Environmental Virology (5)

Examines life in extreme environments with an emphasis on the viruses that live there. Integrates aspects of virology, molecular biology, and computational biology. Students investigate a high-salt, extreme environment at the Don Edwards National Wildlife Refuge, and use DNA extraction methods to find molecular evidence of the organisms that live there and describe the genetic content of viruses and the community living in those high-salt ponds.

Prerequisite: Enrollment is restricted to College Scholar Students, and or by permission of the instructor.

BME 123T - Senior Thesis Writing (5)

For bioengineering senior thesis students, guidance in preparing a draft manuscript describing their senior research project. Students also practice conference-style oral or poster presentation.

Prerequisite: Prerequisite(s): BME 185 or CSE 185E. Concurrent enrollment in BME 193F or BME 195F or BME 198F or CSE 193F or CSE 195F or CSE 198F or ECE 193F or ECE 195F or ECE 198F is required. Enrollment is restricted to senior biomolecular engineering and bioinformatics and bioengineering majors.

BME 128 - Protein Engineering (5)

For bioengineering, bioinformatics, and biology majors, focuses on engineering (i.e., changing) of proteins. Topics focus on practical aspects of protein engineering strategies that are crucial to modern biotechnology and biomedical applications.

Prerequisite: Prerequisite(s): BIOL 20A; and BIOL 100 or BIOC 100A, or by permission of instructor.

BME 128L - Protein Engineering Laboratory (2)

Students address a current scientific question about protein stability using structure-guided protein engineering. Specifically, Students use recombinant DNA technology to produce an engineered protein that is predicted to have enhanced stability. Students then assess its stability with differential scanning fluorimetry.

Prerequisite: Prerequisite(s): BME 128; and BIOL 101L, or BIOL 20L, or BME 21L. Enrollment is restricted to junior and senior bioengineering, biomolecular engineering, and bioinformatics majors; other majors by permission of instructor.

BME 129A - Project Design and Implementation in Biomolecular Engineering I (5)

First of a three-part series focused on senior design projects in biomolecular engineering. In this first part, students examine experiments that elucidated the function of biological macromolecules at the Angstrom scale, and how technologies

related to those functions were invented and implemented. Guided by these examples, each student develops a senior design project concept or small business proposal and defends its utility, plausibility, and inventiveness in a written document and an oral presentation.

Prerequisite: Prerequisite(s): BIOL 20A; BME 23L or BIOL 20L or BIOL 101L; BIOL 100 or BIOC 100A; and previous or concurrent enrollment in BME 185 or CSE 185E. Enrollment is restricted to junior and senior bioengineering and biomolecular engineering and bioinformatics majors or by permission of the instructor.

BME 129B - Project Design and Implementation in Biomolecular Engineering II (5)

Second part of a three-course sequence that is the culmination of the bioengineering program for students who chose a senior design group project to fulfill their capstone requirement. Students apply knowledge and skills gained in biomolecular engineering coursework to articulate, organize, and plan a senior design group project. Student groups complete research, specification, planning, and procurement for their project. Includes technical discussions, design reviews, and formal presentations.

Prerequisite: Prerequisite(s): BME 129A or BME 150. Enrollment is restricted to senior bioengineering or biomolecular engineering and bioinformatics majors.

BME 129C - Project Design and Implementation in Biomolecular Engineering III (5)

Final part of a three-course sequence that is the culmination of the bioengineering program for students who chose a senior design group project to fulfill their capstone requirement. Students apply knowledge and skills gained in biomolecular engineering coursework to articulate, organize, and plan a senior design group project. Student groups complete research, specification, planning, and procurement for their project. Includes technical discussions, design reviews, and formal presentations.

Prerequisite: Prerequisite(s): BME 129A and BME 129B. Enrollment is restricted to senior bioengineering or biomolecular engineering and bioinformatics majors.

BME 130 - Genomes (5)

Advanced elective for biology majors, examining biology on the genome scale. Topics include genome sequencing; large scale computational and functional analysis; features specific to prokaryotic, eukaryotic, or mammalian genomes; proteomics; SNP analysis; medical genomics; and genome evolution.

Prerequisite: Prerequisite(s): BIOL 105 or BME 105; or permission of the instructor.

BME 132 - Evolutionary Genomics (5)

Covers major recent advances in evolutionary genomics. Students learn to analyze and interpret scientific writing in depth. Students also present on work covered in the class and produce one research or review paper. Students cannot receive credit for this courses and course 232.

Prerequisite: Prerequisite(s): BME 105 or BIOL 105 or METX 140. Enrollment is restricted to juniors and seniors.

BME 140 - Bioinstrumentation (5)

Introduces the fundamental aspects of bioinstrumentation that are essential for beginning-level employment in clinical, pharmaceutical, and biotechnology laboratories. The advantages and disadvantages of several instruments are discussed and demonstrated, such as thermocycler, polymerase chain reaction (PCR), next-generation DNA sequencing platforms, pyrosequencing, featureless nanofabrication, ion-sensitive measurements, microarray fabrication, and fluorescent-activated cell sorter (FACS).

Prerequisite: Prerequisite(s): BME 5; or BME 51A and BME 51B; or ECE 101 and ECE 101L; or BIOL 100; or BIOC 100A.

BME 160 - Research Programming in the Life Sciences (6)

No programming experience is required, but basic computer and molecular biology understanding is assumed. Students learn programming in Python to manipulate biological data. Programming assignments comprise the majority of the assignments, and a final project using skills developed in this course is required. Lab section registration is required. BioPython and other modules introduced for use in the final project.

Prerequisite: Prerequisite(s): BIOL 20A or BIOL 21A.

BME 163 - Applied Visualization and Analysis of Scientific Data (3)

Python and its Numpy, Scipy, and Matplotlib packages as well as Inkscape are used on scientific data to generate publication-quality figures. Students cannot receive credit for this course and course 263.

Prerequisite: Prerequisite(s): BME 160 or BME 205. Prerequisites can be waived in cases where students have the required programming skills. Enrollment is restricted to juniors and seniors.

BME 175 - Entrepreneurship in Biotechnology (5)

Focuses on contemporary issues in commercializing biotechnology and genomics, emphasizing development of teamwork and communication skills. Topics include intellectual property management, fundraising, market analysis, and technology development as related to biotechnology start-ups. Students perform real-world tasks preparing for commercialization. Taught in conjunction with BME 275.

BME 177 - Engineering Stem Cells (5)

For bioengineering students interested in stem cells. Class uses project-based learning to discuss basic stem cell concepts and past breakthrough approaches to identify and design solutions for technological hurdles in stem cell research.

Prerequisite: Prerequisite(s): BIOL 20A or by consent of instructor. Basic knowledge of molecular and cellular biology is required.

BME 178 - Stem Cell Biology (5)

Basic concepts, experimental approaches, and therapeutic potential are discussed. Students gain experience in reading the primary scientific literature.

Prerequisite: Prerequisite(s): BIOL 110; BIOL 115 recommended.

BME 180 - Professional Practice in Bioengineering (2)

Seminar course where students develop a research proposal and the collaborative skills needed for independent research projects. Includes professional practice development in collaboration skills, project management, proposal development, and funding.

Prerequisite: Prerequisite(s): previous or concurrent enrollment in BME 185 or CSE 185E. Enrollment is restricted to junior and senior bioengineering, biomolecular engineering and bioinformatics, and bioinformatics majors or by permission.

BME 185 - Technical Writing for Biomolecular Engineers (5)

Writing by biomolecular engineers, not to general audiences, but to engineers, engineering managers, and technical writers. Exercises include job application and resume, library puzzle, graphics, laboratory protocols, document specification, progress report, survey article or research proposal, poster, and oral presentation.

Prerequisite: Prerequisite(s): BIOL 20A; satisfaction of Entry Level Writing and Composition requirements; Enrollment restricted to junior and senior bioengineering, biomolecular engineering and bioinformatics, and biotechnology majors.

BME 188A - Synthetic Biology--Mentored Research A (2)

This two-credit course is the first of three courses in a 12-credit collaborative research project available to students in physical sciences, and biomolecular engineering intended to satisfy the capstone requirement. Provides a multidisciplinary, collaborative research experience working on a project in synthetic biology. Working with one or more research faculty, student teams complete a substantial project. Multiple oral/written presentations are required, including a formal conference presentation. Prerequisite(s): BME 180. Enrollment is restricted to juniors and seniors. Enrollment is by instructor permission.

Prerequisite: Prerequisite(s): BME 180. Enrollment is restricted to juniors and seniors. Enrollment is by instructor permission.

BME 188B - Synthetic Biology--Mentored Research B (5)

This five-credit course is the second of three courses in a 12-credit collaborative research project available to students in physical sciences and biomolecular engineering intended to satisfy the capstone requirement. Multiple oral/written presentations are required, including a formal conference presentation. Prerequisite(s): BME 188A. Enrollment is restricted to juniors and seniors. Enrollment is by instructor permission.

BME 188C - Synthetic Biology Mentored Research C (5)

Third of three courses in a 12-credit collaborative research project available to students in physical sciences and biomolecular engineering intended to satisfy the capstone requirement. Students in this course sequence may be participating in the annual IGEM (International Genetically Engineered Machines) competition. Course includes training in specific skills relevant to the specific sub-team and overall project, including lab-specific training (pcr, DNA electrophoresis, gel documentation, standard reagent prep, lab safety, lab equipment, project specifics). Prerequisite(s): BME 188B. Enrollment is restricted to juniors and seniors. Enrollment is by instructor permission.

BME 193 - Field Study (5)

Provides for individual programs of study with specific aims and academic objectives carried out under the direction of a BME faculty member and a willing sponsor at a field site, using resources not normally available on campus. Credit is based upon written and oral presentations demonstrating the achievement of the objectives of the course. Students submit petition to sponsoring agency.

BME 193F - Field Study (2)

Provides for individual programs of study with specific aims and academic objectives carried out under the direction of a BME faculty member and a willing sponsor at a field site, using resources not normally available on campus. Credit is based upon written and oral presentations demonstrating the achievement of the objectives of the course. Students submit petition to sponsoring agency.

BME 194 - Group Tutorial (5)

A program of study arranged between a group of students and a faculty member. Students submit petition to sponsoring agency.

BME 194F - Group Tutorial (2)

A program of independent study arranged between a group of students and a faculty member. Students submit petition to sponsoring agency.

BME 195 - Senior Thesis Research (5)

Students submit petition to sponsoring agency.

BME 195F - Senior Thesis or Research (2)

Students submit petition to sponsoring agency.

BME 198 - Individual Study or Research (5)

Students submit petition to sponsoring agency.

BME 198F - Individual Study or Research (2)

Students submit petition to sponsoring agency.

BME 199 - Tutorial (5)

For fourth-year students majoring in bioinformatics or bioengineering.

Graduate**BME 201 - Scientific Writing (3)**

Covers effective writing styles for scientific communication for bio-science and engineering graduate students. Covers instruction for writing grant applications, scientific manuscripts, and thesis proposals. Students practice by preparing, editing, and evaluating each of these documents.

Prerequisite: Enrollment is restricted to graduate students.

BME 205 - Bioinformatics Models and Algorithms (5)

Covers bioinformatics models and algorithms: the use of computational techniques to convert the masses of information from biochemical experiments (DNA sequencing, DNA chips, and other high-throughput experimental methods) into useful information. Emphasis is on DNA and protein sequence alignment and analysis.

Prerequisite: Enrollment is restricted to graduate students. Undergraduates may enroll with prerequisite(s): BME 160; and CSE 107 or STAT 131; and concurrent enrollment in BIOC 100A.

BME 215 - Applied Gene Technology (5)

Detailed insight into the techniques and technological trends in genomics and transcriptomics, building the necessary foundations for further research in genetic association studies, population genetic association studies, population genetics, diagnostics, medicine, and drug development. Students should already have a deeper understanding of the basic tools of molecular biotechnology than acquired in introductory courses in biotechnology, biochemistry, and molecular biotechnology.

Prerequisite: Enrollment is restricted to graduate students.

BME 229 - Protein and Cell Engineering (5)

Focuses on established and novel strategies for protein and cell engineering. Explores concepts, design, and practical applications of engineered proteins, cells, and organisms as research tools and in therapeutic applications. Recommended for graduate students with interests in bioengineering.

Prerequisite: Enrollment is restricted to graduate students. Undergraduates by permission of instructor.

BME 230A - Introduction to Computational Genomics and Systems Biology (5)

Introductory and intermediate-level topics in computational genomics, DNA and RNA sequence analysis, mapping, quantification, detection of variants and their associations with disease. Covers topics in machine-learning, probabilistic graphical models, gene regulatory network inference, and single cell analysis. Students conduct related independent research.

Prerequisite: Prerequisite(s): BME 205. Enrollment is restricted to juniors, seniors, and graduate students.

BME 230B - Advanced Computational Genomics and Systems

Biology (5)

Covers advanced topics in computational genomics, DNA and RNA sequence analysis, mapping, quantification, detection of variants and their associations with disease. Topics include machine-learning, probabilistic graphical models, gene regulatory network inference, and single cell analysis. Students participate in teams in a computational analysis competition.

Prerequisite: Prerequisite(s): BME 230A. Enrollment is restricted to juniors, seniors, and graduate students.

BME 232 - Evolutionary Genomics (5)

Covers major recent advances in evolutionary genomics. Students learn to analyze and interpret scientific writing in depth. Students also present on work covered in the class and produce one research or review paper. Students may not receive credit for this course and course 132.

Prerequisite: Enrollment is restricted to graduate students. BME 105 or BIOL 105 or equivalent courses in higher-level genetic processes are highly recommended.

BME 237 - Applied RNA Bioinformatics (5)

Teaches methods for RNA gene discovery; gene expression quantification; probabilistic modeling, secondary structure/trans-interaction prediction; mRNA splicing; and functional analysis. Emphasis on leveraging comparative genomics and employing high-throughput RNA sequencing data. Includes lectures, scientific literature discussion, problem sets, and final gene-discovery project.

Prerequisite: Enrollment is restricted to seniors and graduate students.

BME 263 - Applied Visualization and Analysis of Scientific Data (5)

Python and its Numpy, Scipy, and Matplotlib packages as well as Inkscape are used to generate publication quality figures from scientific data. Students cannot receive credit for this course and course 163.

Prerequisite: Prerequisite(s): BME 160 or BME 205. Prerequisite(s) can be waived in cases where students have required programming skills. Enrollment is restricted to graduate students.

BME 272 - Precision Medicine (5)

Focuses on modern "precision" approaches to understanding human health, where every patient is unique. Explores basic and clinical discoveries and 'omics-based medicine for the prevention, diagnosis, and treatment of disease. Emphasis is on genomic approaches and applications to cancer.

Prerequisite: Enrollment restricted to juniors, seniors, and graduate students.

BME 275 - Entrepreneurship in Biotechnology (5)

Focuses on contemporary issues in commercializing biotechnology and genomics, emphasizing development of teamwork and communication skills. Topics include intellectual

property management, fundraising, market analysis, and technology development as related to biotechnology start-ups. Students perform real-world tasks preparing for commercialization. Taught in conjunction with Biomolecular Engineering 175.

BME 278 - Stem Cell Biology (5)

Basic stem cell concepts, experimental approaches, and therapeutic potential are discussed. Students gain experience in reading and critically evaluating the primary scientific literature. Students cannot receive credit for this course and BME 178.

Prerequisite: Enrollment is restricted to graduate students in PBSE program (Program in Biomedical Science and Engineering: Biomolecular Engineering and Bioinformatics (BMEB), Microbial Biology and Pathogenesis (MICRO), Chemical Biology, Biochemistry and Biophysics (CB3), Molecular, Cell and Developmental Biology (MCDB)) or consent of instructor.

BME 280B - Seminar on Bioinformatics and Bioengineering (2)

Weekly seminar series covering topics of current research in computational biology, and bioinformatics. Current research work and literature in these areas are discussed. Short papers reflecting on presentations required. Available for Satisfactory/Unsatisfactory (or Pass/No Pass) grading only.

BME 281A - Seminar on Processive Enzymes and Nanopores (2)

Weekly seminar series covering experimental research in nanopore technology and single-molecule analysis of polymerase function. Current research work and literature is discussed. Students lead some discussions and participate in all meetings.

Prerequisite: Enrollment is restricted to graduate students. Qualified undergraduates may enroll with permission of instructor.

BME 281C - Seminar in Cancer Genomics (2)

Presents current computational biology research to identify genomics-based signatures of cancer onset, progression, and treatment response. Examples of such investigations include: genetic pathway interpretation of multivariate high-throughput datasets; discovery of mutations in whole-genome sequence; identifications and quantification of gene isoforms, alleles, and copy number variants; and machine-learning tools to predict clinical outcomes. Students present their own research, host journal clubs, and attend lectures and teleconferences to learn about research conducted by national and international projects.

Prerequisite: Enrollment is restricted to graduate students.

BME 281D - Seminar on Protein Engineering (2)

Weekly seminar series covering experimental research in protein structure, function, and engineering. Current research work and literature in this area are discussed. Students lead some discussions and participate in all meetings.

Prerequisite: Enrollment is restricted to graduate students.

BME 281E - Seminar in Genomics (2)

Current topics in genomics including high-throughput sequencing, genome assembly, and comparative genomics. Students design and implement independent research projects. Weekly laboratory meetings are held to discuss these projects and related research in the field.

Prerequisite: Enrollment is restricted to graduate students.

BME 281F - Blood Cell Development (2)

Weekly seminar covering topics in current research on blood cell development and stem cell biology. Current research and literature in these areas discussed. Students lead some discussions and participate in all meetings.

Prerequisite: Enrollment is restricted to graduate students. Undergraduates may enroll with permission of instructor.

BME 281H - Seminar in Comparative Genomics (2)

Weekly seminar series covering topics of current computational and experimental research in comparative genomics. Current research work and literature in this area discussed. Students lead some discussions and participate in all meetings.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with permission of instructor.

BME 281J - Seminar in Computational Genomics and Biomedicine (2)

Research seminar of the UCSC Computational Genomic Laboratory and Platform Teams. Students receive hands-on instruction in modern computational methods to address research questions. Topics include: genomic and transcriptomic sequence analysis methods, comparative and evolutionary genomics, big-data genomic analysis, biomedical data sharing, and precision medicine. Students attend and participate in monthly lab meetings, monthly all-hands meetings, where students give a quick report on their progress and the next month's goals, and a bi-weekly journal club, where pairs of students present and discuss a paper of their choosing with the lab. Students also participate in hands-on, active computational laboratory-based research. Student evaluation is based on suitable progress toward research goals and graduate program progress.

Prerequisite: Enrollment is restricted to graduate students.

BME 281L - Seminar in Computational Genetics (2)

Weekly seminar series covering topics and experimental research in computational genetics. Current research work and literature in this area discussed. Students lead some discussions and participate in all meetings.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with permission of instructor.

BME 281N - Seminar in Transcriptomics (2)

Covers current topics in computational and experimental research in transcriptomics. Current research work and literature discussed. Weekly laboratory meetings held to discuss these projects and related research in the field.

Prerequisite: Enrollment is restricted to graduate students.

BME 281P - Seminar on Nanotechnology and Biosensors (2)

Weekly seminar covering topics of research in the development of new tools and technologies to detect and study genes and proteins. Latest research work and literature in these areas are discussed. Students lead some discussions and participate in all meetings.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with permission of instructor.

BME 281R - Seminar in Stem Cell Genomics (2)

Weekly seminar series covering topics in research on stem cell genomics. Current research and literature in this area is discussed. Students lead some discussions and participate in all meetings.

Prerequisite: Enrollment restricted to graduate students; qualified undergraduates may enroll with instructor permission.

BME 281S - Seminar in Computational Functional Genomics (2)

Weekly seminar series covering topics of current computational and experimental research in computational functional genomics. Current research work and literature in this area discussed. Students lead some discussions and participate in all meetings.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with permission of instructor.

BME 281V - Immunogenomics Seminar (2)

Journal club and research presentations in immunogenomics. Enrollment is by consent of the instructor and is restricted to graduate students, juniors, and seniors.

BME 281Z - Seminar in Population and Evolutionary Genomics (2)

Covers major recent topics in evolutionary and population genomics. Consists primarily of discussions of recent literature and updates on group members' research. Enrollment is available only to members of the Corbett-Detig laboratory.

BME 293 - Seminar in Biomolecular Engineering (5)

Weekly seminar series covering topics of bioinformatics and biomolecular engineering research. Current research work and literature in this area discussed. Students lead some discussions and participate in all meetings.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with permission of instructor.

BME 296 - Research in Bioinformatics (5)

Independent research in bioinformatics under faculty supervision. Although this course may be repeated for credit, not every degree program accepts a repeated course toward degree requirements. Students submit petition to sponsoring agency.

BME 297A - Independent Study or Research (5)

Independent study or research under faculty supervision. Although course may be repeated for credit, not every degree program accepts a repeated course toward degree requirements. Students submit petition to sponsoring agency.

BME 297B - Independent Study or Research (10)

Independent study or research under faculty supervision. Although course may be repeated for credit, not every degree program accepts a repeated course toward degree requirements. Students submit petition to sponsoring agency.

BME 297C - Independent Study or Research (15)

Independent study or research under faculty supervision. Although course may be repeated for credit, not every degree program accepts a repeated course toward degree requirements. Students submit petition to sponsoring agency.

BME 297F - Independent Study or Research (2)

Independent study or research under faculty supervision. Although course may be repeated for credit, not every degree program accepts a repeated course toward degree requirements. Students submit petition to sponsoring agency. Enrollment is restricted to graduate students.

BME 299A - Thesis Research (5)

Thesis research conducted under faculty supervision. Although course may be repeated for credit, not every degree program accepts a repeated course towards degree requirements. Students submit petition to sponsoring agency.

BME 299B - Thesis Research (10)

Thesis research conducted under faculty supervision. Although course may be repeated for credit, not every degree program accepts a repeated course towards degree requirements. Students submit petition to sponsoring agency.

BME 299C - Thesis Research (15)

Thesis research conducted under faculty supervision. Although course may be repeated for credit, not every degree program accepts a repeated course towards degree requirements. Students submit petition to sponsoring agency.

CHEM - CHEMISTRY AND**BIOCHEMISTRY****Lower-Division****CHEM 1A - General Chemistry (5)**

An integrated study of general chemistry. Covers a range of topics including the atomic structure of matter; molecules; chemical reactions; acids and bases; gases; and equilibria in the gas and liquid phase. Students are expected to use algebra to solve problems. General Chemistry is articulated in a full-year series. Partial transfer credit is not allowed for the A,B,C series.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in MATH 3, AM 3, or equivalent, or a mathematics placement score of 300 or higher; taking the online chemistry self-assessment exam is strongly recommended.

CHEM 1B - General Chemistry (5)

An integrated study of general chemistry. Coverage includes quantum mechanics; the hydrogen atom; many-electron atoms and chemical periodicity; elementary covalent bonding; transition metals; and chemical kinetics. Prerequisite(s): Strong high-school level chemistry is strongly recommended; taking the online chemistry self-assessment examination is strongly recommended. Concurrent enrollment in CHEM 1M is recommended. General Chemistry is articulated in a full-year series. Partial transfer credit is not allowed for the A,B,C series.

CHEM 1C - General Chemistry (5)

An integrated study of general chemistry. Coverage includes thermodynamics; oxidation-reduction and electrochemistry; liquids and solids; intermolecular forces and solutions, including colligative properties; and nuclear chemistry. General Chemistry is articulated in a full-year series. Partial transfer credit is not allowed for the A,B,C series.

Prerequisite: Prerequisite(s): CHEM 1A. Concurrent enrollment in CHEM 1N is recommended.

CHEM 1M - General Chemistry Laboratory (2)

Laboratory sequence illustrating topics covered in CHEM 1B and CHEM 1C and important experimental techniques.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in CHEM 1B is required.

CHEM 1N - General Chemistry Laboratory (2)

Laboratory sequence illustrating topics covered in CHEM 1B and CHEM 1C, respectively, and important experimental techniques.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in CHEM 1C is required.

CHEM 8A - Organic Chemistry (5)

Introduces organic chemistry, with an emphasis on bonding and reactivity of organic compounds.

Prerequisite: Prerequisite(s): CHEM 1B and CHEM 1C.

CHEM 8B - Organic Chemistry (5)

Introduction to organic chemistry, with an emphasis on reactivity and synthesis of organic compounds.

Prerequisite: Prerequisite(s): CHEM 8A.

CHEM 8L - Organic Chemistry Laboratory (2)

Laboratory experience in organic chemistry associated with CHEM 8A. Designed to introduce the student to the many techniques associated with organic chemistry while affording an opportunity to explore the concepts discussed in the lecture material. Laboratory: 4 hours, lecture: 1-1/4 hours.

Prerequisite: Prerequisite(s): CHEM 1C and CHEM 1N and previous or concurrent enrollment in CHEM 8A is required.

CHEM 8M - Organic Chemistry Laboratory (2)

Laboratory experience in organic chemistry associated with course 8B. Designed to introduce the student to the many techniques associated with organic chemistry while affording an opportunity to explore the concepts discussed in the lecture material. Laboratory: 4 hours, lecture: 1-1/4 hours.

Prerequisite: Prerequisite(s): CHEM 8A and CHEM 8L and previous or concurrent enrollment in CHEM 8B is required.

CHEM 8N - Honors Organic Chemistry Lab (2)

Honors laboratory experience in organic chemistry associated with course CHEM 8B. Designed to introduce the exceptional student to many of the techniques associated with organic chemistry while taking part in an active organic chemistry research experience. Laboratory: 6 hours per week minimum. Prerequisite(s): CHEM 8A and CHEM 8L; concurrent enrollment in CHEM 8B is required. Enrollment is by permission of the instructor. Students must pass safety training to begin research. Students may only receive credit for one of the following: CHEM 8M or CHEM 8N. This class may only be taken as Pass/No Pass, which cannot be converted to a letter grade.

Prerequisite: Prerequisite(s): CHEM 8A and CHEM 8L concurrent enrollment in CHEM 8B is required.

CHEM 80H - Introduction to Wine Science and Chemistry (5)

A glimpse of the science and technology of wines through critical analysis. Students gain an appreciation of the scientific method and are exposed to data from chemistry, biology, viticulture, and enology. This analysis is extended to examine commonly accepted practices used by scientists vs. non-scientist to assess and describe wine quality. (Formerly Introduction to Wines and Wine Chemistry.)

CHEM 99 - Tutorial (5)

Students submit petition to sponsoring agency.

CHEM 99F - Tutorial (2)

Students submit petition to sponsoring agency.

Upper-Division**CHEM 103 - Biochemistry (5)**

Introduction to biochemistry including biochemical molecules, protein structure and function, membranes, bioenergetics, and regulation of biosynthesis. Provides students with basic essentials of modern biochemistry. Students who plan to do advanced work in biochemistry and molecular biology should take the Biochemistry and Molecular Biology (BIOC) 100 series. Students cannot receive credit for this course after they have completed any two courses from the BIOC 100A, BIOC 100B, and BIOC 100C sequence.

Prerequisite: Prerequisite(s): CHEM 8B.

CHEM 109 - Intermediate Organic Chemistry and Applications to Biology (3)

Integrated study of fundamental organic chemistry, with emphasis on materials especially relevant to biological sciences.

Prerequisite: Prerequisite(s): CHEM 8B or equivalent.

CHEM 110 - Intermediate Organic Chemistry with Emphasis on Synthesis and Analytical Methods (5)

An intermediate study of organic chemistry, including synthetic methods, reaction mechanisms, and application of synthetic chemistry techniques.

Prerequisite: Prerequisite(s): CHEM 8B. Enrollment is restricted to chemistry majors, minors and proposed majors.

CHEM 110L - Intermediate Organic Chemistry Laboratory (2)

Laboratory experience in organic chemistry and associated principles. Experiments involve the preparation, purification, characterization, and identification of organic compounds, and make use of modern as well as classical techniques.

Prerequisite: Prerequisite(s): CHEM 8M and previous or concurrent enrollment in CHEM 110.

CHEM 110N - Honors Organic Chemistry Lab (2)

Honors laboratory experience in organic chemistry associated with CHEM 109 or CHEM 110. Designed to introduce the exceptional student to many of the techniques associated with organic chemistry while taking part in an active organic chemistry research experience. Laboratory: 6 hours per week minimum. Prerequisite(s): CHEM 8A, CHEM 8B and CHEM 8L and either CHEM 8M or CHEM 8N and previous or concurrent enrollment in CHEM 109 or CHEM 110 is required. Enrollment is by permission of the instructor. Students must pass safety training to begin research. Students may only receive credit for one of the following: CHEM 110L, or CHEM 110N. This class may only be taken as Pass/No Pass, which cannot be converted to a letter grade.

Prerequisite: Prerequisite(s): CHEM 8A, CHEM 8B and CHEM 8L and either CHEM 8M or CHEM 8N and CHEM 160; previous or concurrent enrollment in CHEM 109 or CHEM 110 is required.

CHEM 122 - Principles of Instrumental Analysis (5)

A laboratory course designed to develop familiarity with techniques and instrumentation used in analytical chemistry, emphasizing determination of trace inorganic species. Primary emphasis on applications utilizing the absorption or emission of electromagnetic radiation and on voltammetry. Topics include molecular UV-visible absorption and fluorescence spectrometry; atomic absorption, emission and fluorescence spectrometry; and various forms of voltammetry. Lecture: 2 hours; laboratory: 8 hours.

Prerequisite: Prerequisite(s): CHEM 110 and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior chemistry (B.S.) majors.

CHEM 139 - Chemical Problem Solving: Learning to Think Like a Scientist (5)

Students actively develop the skills and strategies required to become proficient problem solvers in both upper-division science classes and in scientific research. The focus is on systematic problem solving and scientific creativity. (Formerly CHEM 139A, Chemical Problem Solving I: Learning to Think Like a Scientist.)

Prerequisite: Prerequisite(s): CHEM 1C; and MATH 11A or MATH 19A.

CHEM 143 - Organic Chemical Structure and Reactions (5)

Advanced topics such as the chemistry of terpenes, steroids, synthetic polymers, alkaloids, reactive intermediates, and reaction mechanisms are treated. Lecture: 4 hours.

Prerequisite: Prerequisite(s): CHEM 110.

CHEM 144 - Catalysis In Organic Synthesis Using Metals and Metalloids Based Reagents (5)

Designed to introduce Junior/Senior undergraduates to the field of catalysis in organic synthesis. Course acquaints students with the chemistry, with relevant techniques of metals and metalloid chemistry, and focuses on new advancements in organoborane field. Also provides knowledge of the methods to use chemistry to address synthetic challenges in organic chemistry. Students become familiar with the concepts and approaches in the current field of chemical biology.

Prerequisite: Prerequisite(s): CHEM 110.

CHEM 146A - Advanced Laboratory in Organic Chemistry (3)

Exposes students to advanced laboratory techniques in organic chemistry. Designed for students without previous research background in organic chemistry. Experiments carry a research-like format and cover the areas of natural products and reaction chemistry. Modern methods of organic analysis are emphasized including chromatographic methods and organic structure determination by spectroscopy. Laboratory: 8 hours.

Prerequisite: Prerequisite(s): CHEM 110 and CHEM 110L; satisfaction of Entry Level Writing and Composition requirements. Enrollment is restricted to chemistry majors. Minors by permission of instructor.

CHEM 146B - Advanced Laboratory in Inorganic Chemistry (3)

Designed to expose students to advanced synthetic and spectroscopic techniques in inorganic chemistry. Examples include anaerobic manipulations, characterization of inorganic materials through spectral assignments and synthesis of coordination and organometallic complexes. Lecture: 1-1/4 hours; laboratory: 8 hours. Students billed a materials fee.

Prerequisite: Prerequisite(s): CHEM 151A and CHEM 151L; CHEM 163A; satisfaction of Entry Level Writing and Composition requirements. Enrollment restricted to chemistry majors. Minors by permission of instructor.

CHEM 146C - Advanced Laboratory in Physical Chemistry (3)

Provides advanced laboratory experience in the areas of nanomaterial synthesis and characterization; spectroscopy; fabrication and measurements energy-conversion devices; and soft lithography techniques and instrumentation. Lecture: 1-1/4 hours; laboratory: 4 hours.

Prerequisite: Prerequisite(s): CHEM 163B and CHEM 164; satisfaction of Entry Level Writing and Composition requirements. Enrollment restricted to chemistry majors. Minors by permission of instructor.

CHEM 151A - Chemistry of Metals (5)

Fundamental topics of inorganic chemistry are presented at the level of the standard texts of field. Special emphasis is given to maintain breadth in the areas of metallic, nonmetallic, and biological aspects of inorganic chemistry. Lecture: 3-1/2 hours; discussion: 1-1/4 hours.

Prerequisite: Prerequisite(s): CHEM 8B and CHEM 8M and CHEM 163A. Concurrent enrollment in CHEM 151L is required.

CHEM 151B - Chemistry of the Main Group Elements (5)

Fundamental aspects of inorganic chemistry of main group elements are discussed. The emphasis is placed on the chemistry of nontransition elements including noble gases and halogens. In addition, students are exposed to the concepts of extended structures, new materials, and solid-state chemistry. Lecture: 3-3/4 hours.

Prerequisite: Prerequisite(s): CHEM 8B and CHEM 8M and CHEM 163A. Recommended for chemistry majors.

CHEM 151L - Inorganic Chemistry Laboratory (2)

Laboratory experience in inorganic chemistry. Experiments involve the preparation, purification, and characterization of inorganic compounds. In addition, experiments are designed to illustrate fundamental principles in inorganic chemistry and are coordinated with lectures in CHEM 151A. Laboratory: 4 hours per week. Laboratory lecture: 1 1/4 hours per week.

Prerequisite: Prerequisite(s): CHEM 8B and CHEM 8M and CHEM 163A. Concurrent enrollment in CHEM 151A is required.

CHEM 156C - Materials Chemistry (5)

Advanced topics in inorganic chemistry and an introduction to solid-state chemistry. Synthesis and structure of materials discussed as well as their influence on properties for modern devices and applications. Recent developments in area of material science also explored. Taught in conjunction with CHEM 256C.

Prerequisite: Prerequisite(s): CHEM 151A. Enrollment is restricted to seniors.

CHEM 163A - Quantum Mechanics and Basic Spectroscopy (5)

A detailed introduction to quantum theory and the application of wave mechanics to problems of atomic structure, bonding in molecules, and fundamentals of spectroscopy. Students cannot receive credit for this course and BIOC 163A.

Prerequisite: Prerequisite(s): CHEM 1B and CHEM 1C; PHYS 5A, PHYS 5B, and PHYS 5C or PHYS 6A, PHYS 6B, and PHYS 6C; and MATH 22 or MATH 23B. PHYS 6C can be taken concurrently.

CHEM 163B - Chemical Thermodynamics (5)

Fundamentals of thermodynamics and applications to chemical and biochemical equilibria. Students cannot receive credit for this course and BIOC 163B.

Prerequisite: Prerequisite(s): CHEM 1B and CHEM 1C, PHYS 6A or PHYS 5A, and MATH 22 or MATH 23B.

CHEM 163C - Statistical Thermodynamics and Kinetics (5)

Statistical mechanics, kinetic theory, and reaction kinetics and topics in spectroscopy. (Formerly Kinetic Theory and Reaction Kinetics, Statistical Mechanics, Spectroscopic Applications.)

Prerequisite: Prerequisite(s): CHEM 163A and CHEM 163B.

CHEM 164 - Physical Chemistry Laboratory (5)

Provides laboratory experience and data analysis in the areas of thermodynamics, kinetics, and spectroscopy. Lecture: 1.75 hours; experimental laboratory: 4 hours; computer laboratory: 2 hours.

Prerequisite: Prerequisite(s): CHEM 1B and CHEM 1C; and PHYS 5A and PHYS 5B and PHYS 5C, or PHYS 6A and PHYS 6B and PHYS 6C; and MATH 22 or MATH 23B. CHEM 163A is recommended.

CHEM 169 - Chemistry and Biology of Drug Design and Discovery (5)

An overview of the central elements of drug discovery, including target selection and validation; computational or virtual screening; high-throughput screening; fragment-based methods; and pharmacokinetics.

Prerequisite: Prerequisite(s): CHEM 103 or BIOC 100A.

CHEM 171 - Chemical Biology (5)

Covers methods and techniques for the field of chemical biology. Brings together methods in chemistry, biochemistry,

and genetics to study the interaction of small molecules with biological systems. Students cannot receive credit for this course and course CHEM 271.

Prerequisite: Prerequisites: CHEM 8B, and CHEM 103 or BIOC 100A. Enrollment is restricted to senior chemistry, biochemistry or related life science majors and minors. BIOL 101 and CHEM 110 recommended but not required.

CHEM 192 - Dir Stu Teach (5)

Dir Stu Teach

CHEM 194 - Senior Essay (5)

An individually supervised course with emphasis on reviewing the current scientific literature. Students are required to submit a summary and a critique of a scientific paper in the form of a senior essay. Students submit a petition to the sponsoring agency. This course may not be repeated for credit.

CHEM 195A - Senior Research (5)

An individually supervised course with emphasis on independent research. Multiple-term course extending over two or three quarters; the grade and evaluation submitted for the final quarter apply to all previous quarters. Students submit petition to sponsoring agency; may not be repeated for credit.

CHEM 195B - Senior Research (5)

An individually supervised course with emphasis on independent research. Multiple-term course extending over two or three quarters; the grade and evaluation submitted for the final quarter apply to all previous quarters. Students submit petition to sponsoring agency; may not be repeated for credit.

CHEM 195C - Senior Thesis (5)

An individually supervised course with emphasis on independent research. Multiple-term course extending over two or three quarters; the grade and evaluation submitted for the final quarter apply to all previous quarters. Students submit petition to sponsoring agency; may not be repeated for credit.

CHEM 199 - Tutorial (5)

Students submit petition to sponsoring agency.

CHEM 199F - Tutorial (2)

Students submit petition to sponsoring agency.

Graduate**CHEM 200A - Advanced Biochemistry: Biophysical Methods (5)**

An introduction to the theory, principles, and practical application of biophysical methods to the study of biomolecules, especially proteins and nucleic acids. Emphasis on spectroscopic techniques. Topics include magnetic resonance, optical spectroscopy, fast reaction techniques, crystallography, and mass spectrometry.

CHEM 200B - Advanced Biochemistry: Macromolecular

Structure and Function (5)

A detailed discussion of nucleic acid and protein chemistry, ranging from the structure, thermodynamics, and folding to the relationship between structure and function, and encompassing the methods used to determine such information.

CHEM 200C - Advanced Biochemistry: Enzyme Mechanisms and Kinetics (5)

A study of enzyme kinetics, mechanisms, and factors involved in enzymic catalysis. Lecture: 3-1/2 hours.

CHEM 222 - Career Success in Industrial Science/ Engineering (2)

Provides skills for the transition from academia into industrial research careers, addressing presentation skills, project prioritization, teamwork, salary-benefit expectations, intellectual property, performance reviews, Myers-Briggs profiles, and career planning. Participant teams will analyze the commercialization of a technical innovation.

Prerequisite: Enrollment is restricted to Physical and Biological Sciences and School of Engineering graduate students who have completed one consecutive year. Undergraduates may enroll on a space available basis by permission of instructor.

CHEM 230 - Grant Writing in Biomedical Research (5)

Introduces the fundamentals of grant writing in biomedical research, including best practices for presentation of data and communication of research findings. Students write and peer-edit most components of the NIH Ruth L. Kirschstein F31 predoctoral fellowship. Course is designed for students in their second year or later of graduate study.

Prerequisite: Enrollment is restricted to graduate students.

CHEM 234 - Bioinorganic Chemistry (5)

The role played by transition metals in biological systems is discussed through application of the principles of coordination chemistry and inorganic spectroscopy. Topics include metalloproteins involved in oxygen binding, iron storage, biological redox reactions, and nitrogen fixation, as well as metal complexes of nucleic acids. Lecture: 4 hours.

Prerequisite: Prerequisite(s): CHEM 151A, CHEM 151L, CHEM 163A, and BIOC 100A; or graduate students.

CHEM 238 - Topics in Biophysical Chemistry (5)

A discussion of the application of selected topics in biophysical chemistry to contemporary problems in biochemistry and molecular biology. Lecture: 3-1/2 hours.

CHEM 242A - Modern Physical Organic Chemistry (5)

Covers molecular structure and bonding, strain, and non-covalent binding forces. Other topics include acid-base chemistry, kinetics, thermodynamics, catalysis, organic reactions and mechanism, and quantum mechanical approaches to the analysis of organic molecules.

Prerequisite: Enrollment is restricted to seniors who have taken CHEM 143, and graduate students.

CHEM 242B - Modern Synthetic Methods in Organic Chemistry (5)

Presents concepts in bond formation, conformation, selectivity, and stereocontrol in modern organic synthesis. Focuses on understanding reaction mechanisms. Culminates with strategy in designing multi-step synthesis of complex targets.

Prerequisite: Enrollment is restricted to seniors who have taken CHEM 143, and graduate students.

CHEM 242C - Spectroscopy and Applied Analytical Methods (5)

Presents strategies in organic structure elucidation, including nuclear magnetic resonance (NMR) and mass spectrometry. Provides theory and practical elements of structure elucidation and modern analytical methods for organic molecules.

Prerequisite: Enrollment is restricted to seniors who have taken CHEM 143, and graduate students.

CHEM 244 - Organic Free Radical Chemistry (5)

Explores organic free radicals. Fundamental principles in physical chemistry provide an understanding of free-radical transformations in organic synthesis, polymerization, and some examples of free radicals in biology. For students who have a firm grounding in organic chemistry.

Prerequisite: Enrollment is restricted to graduate students.

CHEM 247 - Using DFT Computational Methods to Study Molecular Structure and Reactivity (5)

This course is fully hands-on, highly interactive, and project-based. Students receive extensive training on the DFT program Gaussian and are then offered the opportunity to deepen their knowledge, tailored to their specific research projects. Students have the option to bring in their own molecules of interest from their research laboratories.

Prerequisite: Enrollment is restricted to graduate students.

CHEM 256A - Advanced Topics in Inorganic Chemistry (5)

Advanced topics in inorganic chemistry are presented. Topics covered vary from year to year, and are announced in advance. Possible topics include A) organometallic chemistry; B) structural methods in inorganic chemistry; C) solid-state chemistry.

Prerequisite: Enrollment is restricted to graduate students or previous enrollment in CHEM 151A, CHEM 151L, and CHEM 146B.

CHEM 256B - Advanced Topics in Inorganic Chemistry (5)

Advanced topics in inorganic chemistry are presented. Topics covered vary from year to year, and are announced in advance. Possible topics include A) organometallic chemistry; B) structural methods in inorganic chemistry; C) solid-state chemistry.

Prerequisite: Enrollment is restricted to graduate students or previous enrollment in CHEM 151A, CHEM 151L, and CHEM 146B.

CHEM 256C - Advanced Topics in Inorganic Chemistry (5)

Advanced topics in inorganic chemistry are presented. Topics covered vary from year to year, and are announced in advance. Possible topics include A) organometallic chemistry; B) structural methods in inorganic chemistry; C) solid-state chemistry.

Prerequisite: Enrollment is restricted to graduate students or previous enrollment in CHEM 151A, CHEM 151L, and CHEM 146B.

CHEM 256D - X-ray Crystallography (5)

Course in chemical crystallography focuses on the needs of small-molecule, single-crystal diffraction studies. Includes diffraction theory, space-group analysis, data collection, structure solution, and refinement. Practical component: use of diffraction equipment and solution/refinement software.

Prerequisite: Enrollment is restricted to graduate students and seniors who have taken CHEM 151A, CHEM 151L, and CHEM 163A.

CHEM 261 - Foundations of Spectroscopy (5)

The basic theory of time-dependent processes is covered at an advanced level. The interaction of electromagnetic radiation and matter is described using both semiclassical and quantum field formulations. A variety of modern spectroscopic techniques are discussed both in terms of the basic processes and their use in the elucidation of chemical structure and dynamics.

Prerequisite: Enrollment is restricted to chemistry graduate students or previous enrollment in CHEM 163A.

CHEM 262 - Statistical Mechanics (5)

Theory and concepts of statistical mechanics with applications to ideal gases, condensed systems, phase transition, and non-equilibrium thermodynamics. Lecture: 3-1/2 hours.

Prerequisite: Enrollment is restricted to chemistry graduate students or previous enrollment in CHEM 163A.

CHEM 263 - Quantum Mechanics (5)

A rigorous introductory course: the Schrödinger equation, operator formalism, matrix mechanics, angular momentum, and spin. Perturbation and other approximate methods. Applications to atomic and molecular problems. Lecture: 3-1/2 hours.

Prerequisite: Enrollment is restricted to chemistry graduate students or previous enrollment in CHEM 163A, PHYS 116A, and PHYS 116B.

CHEM 265 - Computer Simulation in Statistical Mechanics (5)

A detailed introduction of the use of computer simulation methods in physical and biophysical chemistry. Includes review of thermodynamics and statistical mechanics, molecular

mechanics, molecular dynamics, and Monte-Carlo methods. Applications to liquid structure, reaction dynamics, and protein dynamics.

CHEM 268 - Solid State and Materials Chemistry (5)

Topics include synthesis of solid-state materials and their characterization using experimental techniques: XRD, TEM spectroscopy, NMR, and their applications in technologies. Emphasis on new materials, e.g., polymer, biopolymers, nanomaterials, organic/inorganic composites, ceramics, superconductors, electronic, magnetic, and opto-electronic materials.

Prerequisite: Enrollment is restricted to chemistry graduate students or students previously enrolled in CHEM 163A and CHEM 163B.

CHEM 269 - Electrochemistry (5)

Designed to introduce basic principles and applications of electrochemistry to students at upper undergraduate and lower graduate levels in various fields including analytical, physical, and materials chemistry.

Prerequisite: Enrollment is restricted to seniors and graduate students.

CHEM 271 - Chemical Biology (5)

Methods and techniques for the field of chemical biology. Brings together methods in chemistry, biochemistry, and genetics to study the interaction of small molecules with biological systems. Students cannot receive credit for this course and CHEM 171.

Prerequisite: Enrollment is restricted to chemistry graduate students.

CHEM 274 - Proseminar in Synthetic and Polymer Chemistry (5)

Weekly meetings devoted to study of synthetic organic chemistry and controlled polymer design for applications in nanotechnology. Topics drawn from current literature and research interests of participants.

CHEM 275 - Proseminar in Biological Inorganic Chemistry (5)

Weekly meetings devoted to biological inorganic chemistry and biochemistry. Topics are drawn from current literature. Papers and reviews are discussed, and participants give short seminars on their research interests.

CHEM 280 - Proseminar in Materials Chemistry (5)

Weekly meetings devoted to materials and inorganic research. Topics are drawn from current literature. Papers and reviews are discussed. Participants also give short seminars on topics of their research interests.

CHEM 282 - Proseminar: Synthetic Methods (5)

Weekly meetings devoted to the study of asymmetric and/or enantio-selective synthesis of optically active organic compounds of biological and medicinal significance. Topics

drawn from the current literature and the research interests of the participants.

Prerequisite: Enrollment is restricted to graduate students.

CHEM 284 - Proseminar in Synthetic Organic Chemistry (5)

Weekly meetings devoted to the study of synthetic organic chemistry. Topics drawn from the current literature and the research interests of the participants.

Prerequisite: Enrollment is restricted to graduate students.

CHEM 285 - Proseminar: Photobiochemistry and Photobiology (5)

A detailed study of molecular mechanisms of light energy conversion and light-signal transduction processes in biological systems. Student participation in critical discussion of current literature examples are emphasized. Two-hour lecture and two-hour seminar weekly.

Prerequisite: Enrollment is restricted to graduate students.

CHEM 286 - Proseminar in Natural Products Chemistry (5)

Weekly meetings devoted to the study of natural products. Topics drawn from the current literature and research interests of the participants.

Prerequisite: Enrollment is restricted to graduate students.

CHEM 288 - Proseminar in Bioinorganic Chemistry (5)

Weekly meetings devoted to inorganic and bioinorganic research. Topics are drawn from current literature. Papers and reviews are discussed. Participants also give short seminars on topics of their research interests.

CHEM 291 - Chemistry and Biochemistry Research Seminar (5)

A weekly chemistry and biochemistry seminar series covering recent developments and current research, led by experts from other institutions, as well as local speakers. Open to chemistry and biochemistry graduate students.

Prerequisite: Enrollment is restricted to graduate students.

CHEM 292 - Seminar (2)

Prerequisite: Enrollment is restricted to graduate students or approval of the graduate adviser.

CHEM 296 - Teaching Chemistry (2)

University-level pedagogy in chemistry; examines the role of preparation, assessment, and feedback in teaching chemistry discussion and laboratory sections. Effective classroom techniques and organizational strategies discussed; oral presentations analyzed critically. Required of entering chemistry graduate students.

Prerequisite: Enrollment is restricted to chemistry graduate students.

CHEM 297A - Independent Study (5)

A topic will be studied with faculty tutorial assistance to satisfy a need for the student when a regular course is not available. Students submit petition to sponsoring agency.

CHEM 297B - Independent Study (10)

A topic will be studied with faculty tutorial assistance to satisfy a need for the student when a regular course is not available. Students submit petition to sponsoring agency.

CHEM 299A - Thesis Research (5)

Thesis Research

CHEM 299B - Thesis Research (10)

Thesis Research

CHEM 299C - Thesis Research (15)

Thesis Research

CHIN - CHINESE

Lower-Division

CHIN 1 - First-Year Chinese (5)

Instruction in elementary spoken and written Chinese (Mandarin), beginning with the sounds of Chinese and their representation in the pinyin romanization system. Conversation, structural analysis, and an introduction to character texts. The first-year sequence (1-2-3) begins only in the fall quarter. Students interested in learning Chinese who are uncertain about where they should enter the sequence should meet with the instructor prior to the first class meeting.

CHIN 2 - First-Year Chinese (5)

Continuation of Chinese 1, which assumes that students are familiar both with the pinyin romanization system and approximately 150 basic characters.

Prerequisite: Prerequisite(s): CHIN 1 or by consent of instructor.

CHIN 3 - First-Year Chinese (5)

Continuation of Chinese 2, which assumes that students are familiar both with the pinyin romanization system and approximately 300 basic characters.

Prerequisite: Prerequisite(s): CHIN 2 or by consent of instructor.

CHIN 4 - Second-Year Chinese (5)

Instruction in intermediate spoken and written Chinese (Mandarin). Conversation, composition, and the reading of modern texts. The second-year sequence (4-5-6) begins only in the fall quarter.

Prerequisite: Prerequisite(s): CHIN 3 or by consent of instructor.

CHIN 5 - Second-Year Chinese (5)

Continuation of Chinese 4. Conversation, composition, and the reading of modern texts.

Prerequisite: Prerequisite(s): CHIN 4 or CHIN 4H or by consent of instructor.

CHIN 6 - Second-Year Chinese (5)

Continuation of Chinese 5. Conversation, composition, and the reading of modern texts.

Prerequisite: Prerequisite(s): CHIN 5 or CHIN 5H or by consent of instructor.

CHIN 94 - Group Tutorial (5)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Students submit petition to sponsoring agency.

CHIN 99 - Tutorial (5)

Students submit petition to sponsoring agency.

CHIN 99F - Tutorial (2)

Students submit petition to sponsoring agency.

Upper-Division**CHIN 103 - Advanced Chinese: Language and Society (5)**

Designed to enhance the students' ability to understand, analyze, and discuss authentic Chinese reading materials. Chinese linguistic and cultural aspects are introduced.

Prerequisite: Prerequisite(s): CHIN 6 or by consent of instructor.

CHIN 104 - Advanced Chinese: Readings in Literature (5)

Close readings in Chinese vernacular literature of recognized merit from contemporary and modern writers as well as from models from the traditional period. Student are introduced to the basic critical issues, in Chinese, relating to narrative and drama, revealed by the works under discussion.

Prerequisite: Prerequisite(s): CHIN 103 or CHIN 105 or CHIN 107 or CHIN 108; or by consent of instructor.

CHIN 105 - Advanced Chinese: Readings in History (5)

Offers an appreciation of some of the central issues in Chinese history as defined by Chinese historians of the 20th century. Through readings of graduated difficulty, the vocabulary, style, and form of modern Chinese historical writing are introduced.

Prerequisite: Prerequisite(s): CHIN 103 or CHIN 104 or CHIN 107 or CHIN 108; or by consent of instructor.

CHIN 107 - Introduction to Classical Chinese Prose (5)

Introduces the grammar and lexicon of classical Chinese and the language of China's pre-modern canonical writings in philosophy, religion, history, music, visual art, and literature. Reading from the Han and pre-Han era is featured.

Prerequisite: Prerequisite(s): CHIN 103 or CHIN 104 or CHIN 105 or CHIN 108; or by consent of instructor.

CHIN 108 - Introduction to Classical Chinese Poetry (5)

Introduces the grammar and lexicon of classical Chinese and the language of China's pre-modern canonical writings in philosophy, religion, history, music, visual art, and literature. Classical poetry and lyrics are featured.

Prerequisite: Prerequisite(s): CHIN 103 or CHIN 104 or CHIN 105 or CHIN 107; or by consent of instructor.

CHIN 194 - Group Tutorial (5)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Students submit petition to sponsoring agency.

CHIN 199 - Tutorial (5)

Students submit petition to sponsoring agency.

CHIN 199F - Tutorial (2)

Students submit petition to sponsoring agency.

CLNI - COLLEGE NINE**Lower-Division****CLNI 1 - Academic Literacy and Ethos: International and Global Perspectives (5)**

Teaches foundational concepts for intellectual exploration and personal development within an academic community: analysis, critical thinking, metacognition, engagement with others across difference, and self-efficacy. Addresses large-scale political, cultural, and economic issues to inform global citizenship.

Prerequisite: Enrollment is restricted to first-year college members.

CLNI 1A - Introduction to University Life and Learning (1)

Orientation to and exploration of the nature of the liberal arts, and of learning at research universities. Topics include: academic planning for upper-division coursework; enrollment processes; and understanding pathways to degree completion; UCSC resources that support health and well-being strategies for academic success; the cultivation of just communities; the prevention of sexual harassment and violence; campus conduct policies; awareness of risks associated with drug and/or alcohol use; and an introduction to traditions of community-engaged learning, ground-breaking research, and interdisciplinary thinking that define a UC Santa Cruz degree. This course can be taken for Pass/No Pass grading only.

Prerequisite: Enrollment is restricted to entering first-year College Nine students.

CLNI 60 - Water Justice: Global Insights for a Critical Resource (5)

Groundwater is a challenging resource to manage and conserve, one critically depleted across our state, country and world.

Course explores the many manifestations of groundwater access, use and justice on multiple interlocking scales (i.e. local, national, transnational) while illustrating analytical ideas connecting to a range of socio-environmental processes including urbanization and infrastructure development, deprivation and exclusion, privatization of land and water, and claims for human rights. We will draw from cases based on our multi-country research project that brings together scholars and practitioners from Latin America, Europe, Africa and South Asia. Students will have the opportunity to conduct qualitative and secondary research contributing to the California case study in the Central Coast, focused on groundwater governance and perspectives of Latinx farmworkers and residents.

Prerequisite: Enrollment is restricted to College Scholars students.

CLNI 70 - Colleges Nine and Ten Community Garden (2)

Students in this course design and build a new community garden at Colleges Nine and Ten. Students engage in a collaborative design process with campus stakeholders; learn hands-on skills and community gardening best practices; and build regenerative social and ecological systems.

Prerequisite: Enrollment is restricted to College Nine and College Ten students.

CLNI 85 - Global Action (2)

Workshop facilitated by peer instructors. Students learn about current international and global issues through interactive exercises, small-group discussions, and faculty presentations. Students develop an action plan to raise awareness about one or more of these concerns and take practical steps to create positive change in the world.

Prerequisite: Enrollment is restricted to College Nine members during priority enrollment only.

CLNI 86 - College Leadership Development (2)

Students newly appointed into leadership positions at College Nine explore the concept of leadership relating to the college's theme of International and Global Perspectives. Prerequisite(s): current College Nine student leader; permission of instructor.

CLNI 90 - Intercultural Understanding (2)

Provides an opportunity to enhance the intercultural experience, increase cultural competency, promote further understanding, and examine the various trends facing a uniquely diverse community. Geared toward U.S. and international students affiliated with the International Living Center. Enrollment by instructor permission.

CLNI 91 - Global Issues Colloquium (1)

Weekly colloquium on global issues with different topical focus each quarter. Presentations by UCSC faculty and invited speakers. Students must attend class, read an assigned article, and write a one-page synopsis.

Prerequisite: Enrollment is restricted to College Nine members.

Upper-Division

CLNI 105 - Researching Food Sovereignty (5)

Students engage in individual and collective research projects on transformational food systems in the United States and abroad. Readings look at the current global food system and grassroots responses to food and environmental crises.

Prerequisite: Enrollment is restricted to junior and senior College Nine and College Ten members during priority enrollment only.

CLNI 106 - Israel and Palestine: Pathways to a Deeper Understanding (2)

Explores, and seeks to provide a deeper understanding of, the Israeli-Palestinian conflict through materials and guest speakers that offer varying perspectives. Self-reflection and structured communication facilitate the positive exchange of ideas and views. Enrollment by permission of instructor.

CLNI 112A - Model United Nations Part A: A Group Seminar (2)

Introduces the Model United Nations. Students learn parliamentary procedure and U.N. protocols, as well as how to research and present position papers to the general assembly. Students learn resolution writing, alliance building, and persuasive speech. (Formerly course 112, Model United Nations: A Group Seminar)

CLNI 112B - Model United Nations Part B: International Crises (2)

Students are assigned a country to represent in the U.N. Three international crises allow students to present position papers, make speeches, and debate the issues.

Prerequisite: Prerequisite(s): CLNI 112A.

CLNI 115 - Community Investing for Social Good: A Micro-finance Lab (2)

Service-learning laboratory course that centers around investing by and in students to seed new social, economic, and environmental projects, ultimately aiming to build a campus culture of community investing to address needs linked to poverty and inequality.

CLNI 120 - Practical Activism Conference Planning and Development (2)

Offers an applied experience of collaborative planning, production, and leadership. Students plan workshops and other event components; conduct outreach and publicity; and address all aspects of educational event planning. Enrollment restricted to members of the spring volunteer Practical Activism planning group. Enrollment by permission of the instructor.

CLNI 140 - Designing Your Life (5)

Do you ever think, "I want to make a difference!" but don't know where to start? In this class students learn design thinking methods by addressing the question of what they want to do with their lives after college. Students build deeper awareness

of values and goals, define areas of life and work they want to grow in, examine multiple life paths and careers that interest them, and take small steps to try these out. This is an experiential class that asks students to try new ways of thinking and step outside their comfort zone, all within a supportive community of peers.

Prerequisite: Enrollment is restricted to juniors and seniors.

CLNI 191 - Teaching Global Action (5)

Undergraduates at upper-division level participate in teaching discussion groups for CLNI 85 (W). Prerequisite(s): permission of instructor: essay describing interest in becoming course assistant, copies of evaluations, and letter of recommendation from faculty member and/or college staff member. Enrollment is restricted to College Nine juniors and seniors.

CLNI 199 - Tutorial (5)

Individual directed study for upper-division college members with college-affiliated faculty. Students must submit petition with one of the college academic advisers with accompanying letter from faculty adviser. Approval of provost required. Enrollment is restricted to upper-division College Nine members.

CLNI 199F - Tutorial (2)

Individual directed study for upper-division college members with college-affiliated faculty. Students must submit petition with one of the college academic advisers with accompanying letter from faculty adviser. Approval of provost required. Enrollment is restricted to upper-division College Nine members.

CLST - CLASSICAL STUDIES

Lower-Division

CLST 99 - Tutorial (5)

Students submit petition to sponsoring agency.

Upper-Division

CLST 197F - Senior Comprehensive Examination Preparation (2)

Students submit petition to sponsoring agency.

CLST 199 - Tutorial (5)

Students submit petition to sponsoring agency.

CLST 199F - Tutorial (2)

Students submit petition to sponsoring agency.

CLTE - COLLEGE TEN

Lower-Division

CLTE 1 - Academic Literacy and Ethos: Social Justice and

Community (5)

Teaches foundational concepts for intellectual exploration and personal development within an academic community: analysis, critical thinking, metacognition, engagement with others across difference, and self-efficacy. Reflects our college theme of Social Justice and Community, addressing topics such as identity formation, inequality, and environmental injustice.

Prerequisite: Enrollment is restricted to first-year college members.

CLTE 1A - Introduction to University Life and Learning (1)

Orientation to and exploration of the nature of the liberal arts, and of learning at research universities. Topics include: academic planning for upper-division coursework; enrollment processes; and understanding pathways to degree completion; UCSC resources that support health and well-being strategies for academic success; the cultivation of just communities; the prevention of sexual harassment and violence; campus conduct policies; awareness of risks associated with drug and/or alcohol use; and an introduction to traditions of community-engaged learning, ground-breaking research, and interdisciplinary thinking that define a UC Santa Cruz degree. This course can be taken for Pass/No Pass grading only.

Prerequisite: Enrollment is restricted to entering first-year College Ten students.

CLTE 30 - (H)ACER Undergraduate Community Internship (2)

Student Internship through the Apprenticeship in Community Engaged Research (H)ACER Program at College Nine and College Ten. The (H)ACER Program joins community engagement with critical reflexive components of qualitative research to support transformative learning and strengthen community-university partnerships. Students will be placed at a variety of internships and work with our community partners such as Calabasas Elementary School classroom teachers, Calabasas Elementary School After School Program, Calabasas Community Garden, and Watsonville High School classroom teachers. Students also may propose internships if they already have strong ties with a community partner and receive approval from the (H)ACER Director. Requires students to read selected readings on critical service learning, community learning, qualitative research methods and a variety of texts relevant to the history, context and activities at the sites where they will intern. Internships will take place primarily in Watsonville. Enrollment by permission of the instructor.

CLTE 35 - Knowledge For Justice (5)

Introduction to the (H)ACER program at College 10. (H)ACER trains students in participatory research methodologies and creates opportunities for students to work in real world contexts addressing issues such as social, economic, educational, and environmental injustice. Students gain a foundation in understanding the context of the research university and developing critical research methods for working with communities. Students grapple with questions of how to conduct research in an ethical way and to build relationships that both recognize and are not foreclosed by histories of

violence, with particular attention to race, class, gender, and nationality.

CLTE 60 - Understanding Sustainability: Researching Environmental Justice at UCSC (5)

Through readings, discussions, and primary research on campus, course explores the following questions: What is sustainability at UCSC and what assumptions about the relationships between humans and nature are privileged in these definitions? (Formerly, I Couldn't Imagine Myself Anywhere Else: Understanding UCSC Undergraduate Narratives.)

Prerequisite: Enrollment is restricted to College Scholars students.

CLTE 85 - Social Justice Issues Workshop (2)

Series of presentations, films, and workshops that address personal and cultural identity and examine social, cultural, political, environmental, and other justice concerns.

Prerequisite: Enrollment is restricted to College Ten members during priority enrollment only.

CLTE 86 - College Leadership Development (2)

Students newly appointed into leadership positions at College Ten explore the concept of leadership relating to the college's theme of Social Justice and Community. Prerequisite(s): current College Ten student leader; permission of instructor.

CLTE 92 - Social Justice Issues Colloquium (1)

Weekly colloquium on social justice issues with a different topical focus each quarter. Presentations by UCSC faculty and invited speakers. Students must attend class, read an assigned article or book chapter(s) on the week's topic, and write a one-page synopsis.

CLTE 95 - Social Justice and Nonviolent Communication (Rumi's Field) (2)

Nonviolent Communication provides tools for the work needed to bring our reality closer to the ideal of a world with dignity and equity for all its members. Explores righteous anger, grief, empathy, diplomacy, and making requests others want to say "yes" to. The course nickname is "Rumi's Field," which comes from a Rumi poem: "out beyond ideas of wrongdoing and rightdoing/there is a field/I'll meet you there." Formerly Social Justice and Nonviolent Communication (Rumi's Field Living-Learning Community).

CLTE 98 - Alternative Spring Break (2)

Provides students with the opportunity to conduct service-learning work in a local Santa Cruz community over spring break. There are four preliminary class meetings in the winter quarter. Winter meeting attendance is required. Enrollment is by interview only. Enrollment is restricted to College Nine and College Ten members.

Upper-Division

CLTE 105 - The Making and Influencing of Environmental

Policy (5)

Explores how environmental policy is made and influenced. Students learn about key contemporary environmental issues and the forces at play in determining environmental policy outcomes. Focuses on skills that enable citizens to impact environmental policy.

Prerequisite: Enrollment is restricted to sophomore, junior, and seniors.

CLTE 106 - Expressive Arts for Social Justice (2)

Students explore their own creative output in order to inspire community dialogue around social justice issues. Open to those who identify as artists as well as those who do not. Interested students must attend an information session and commit to expectations. Preference is given to College Nine and College Ten members.

CLTE 115 - Research Methods for Social Justice (2)

Fosters a deeper intellectual engagement with the theme of College Ten through the design and implementation of community-based research projects developed in close consultation with community partners. Students gain methodological, teamwork, and critical-thinking skills while furthering social justice. Prerequisite(s): CLNI 85, or CLTE 85, or equivalent. Enrollment is restricted to College Nine and College Ten members and by permission of instructor.

CLTE 120 - Practical Activism Conference Planning and Development (2)

Offers an applied experience of collaborative planning, production, and leadership. Students plan workshops and other event components; conduct outreach and publicity; and address all aspects of educational event planning. Enrollment is restricted to members of the spring volunteer Practical Activism planning group. Enrollment is by permission of the instructor.

CLTE 125A - Transcommunal Peace Making (2)

Explores the theoretical tenets and applications of Transcommunality, an outgrowth of the principles of Kingian non-violence, which works toward peace, tolerance, and mutual respect across difference and diversity. UCSC students connect with the Cemanahuac Cultural group, a multi-ethnic and multi-racial gathering of incarcerated men who are warriors for peace within and outside the prison community. Three meetings will be held at the Correctional Training Facility (CTF) in Soledad, California. Enrollment is restricted to junior and senior College Ten members and by interview.

CLTE 125B - Transcommunal Peace Making (2)

Explores the principles of community, guided by established texts, for inmates at the Correctional Training Facility (CTF) in Soledad, California. Covers the theoretical tenets and applications of Transcommunality, an outgrowth of the principles of Kingian non-violence. Three joint meetings will be held with UCSC students enrolled in the parallel course 125A. Enrollment by permission of instructor.

CLTE 135 - Apprenticeship in Community Engaged Research (5)

Course takes a holistic approach in familiarizing students about how to effectively and ethically conduct community engaged research, from contextualized understandings of power and knowledge to hands-on training in various methodologies through a class project. The topical focus of the course varies (e.g., sustainability, water justice, educational equity etc.).

CLTE 136 - Methodologies of Critical Praxis (5)

Considers an ethic of engaging with communities that honors existing knowledges and integrates them into community-engaged action plans and research strategies. Explores a list of questions critical scholars must consider when building socially just community partnerships. Interrogates notions of help and volunteerism and explores theories and practices of popular education as a praxis engagement. Includes practice interviews, oral histories, field notes, and other research methods. Interacts with community partners through forums, blogs, and other multimedia.

Prerequisite: Prerequisite(s): CLTE 135 or an equivalent course.

CLTE 191 - Teaching Social Justice (5)

Undergraduates at upper-division level participate in teaching discussion groups for College Ten 85 (W). Prerequisite(s): permission of instructor: essay describing interest in becoming course assistant, copies of evaluations, and letter of recommendation from faculty member and/or college staff member. Enrollment is restricted to College Ten juniors and seniors.

CLTE 194 - Group Tutorial (5)

Independent study through which a group of students explores a particular topic in consultation with an instructor.

Prerequisite(s): CLTE 91 or CLTE 105 recommended. Students submit petition to sponsoring agency.

CLTE 194F - Group Tutorial (2)

Independent study through which a group of students explores a particular topic in consultation with an instructor.

Prerequisite(s): CLTE 91 or CLTE 105 recommended. Students submit petition to sponsoring agency.

CLTE 199 - Tutorial (5)

Individual directed study for upper-division college members with college-affiliated faculty. Students must submit petition with one of the college academic advisers with accompanying letter from faculty adviser. Approval of provost required. Enrollment is restricted to upper-division College Ten members.

CLTE 199F - Tutorial (2)

Individual directed study for upper-division college members with college-affiliated faculty. Students must submit petition with one of the college academic advisers with accompanying letter from faculty adviser. Approval of provost required. Enrollment is restricted to upper-division College Ten members.

CMMU - COMMUNITY STUDIES**Lower-Division****CMMU 10 - Introduction to Community Activism (5)**

Surveys different strategies of community activism including charity, volunteering, labor and community organizing, and recently emerging global activism with goal of demonstrating how certain strategies challenge existing social relations and arrangements while others typically (and often by design) reproduce them.

CMMU 20 - Media and Social Movements (5)

From #BlackLivesMatter to #MeToo, from the Women's March on Washington to the March for Our Lives following the Stoneman Douglas High School shooting, a new generation of activists is using media to advance social justice goals. From the perspectives of sociology, psychology, and political science, course explores how contemporary activists harness a diverse range of media tools and platforms for social change and how contemporary strategies are rooted in and/or diverge from historical practices of using media to effect social and political change. Defines "media" broadly to include social media and legacy media forms, such as radio, television, and print journalism.

CMMU 30 - Numbers and Social Justice (5)

Relates simple lessons of quantitative thinking to topical materials that are accessible and relevant to working for justice and social change. Students learn practical techniques to distinguish credible statistical evidence from misleading statistical claims.

CMMU 42A - Student-Directed Seminar: Perceptions and Presentations of Transness (5)

Explores how the concept of transgender identity has developed in the U.S., evolving from a cisnormative depiction of gender to an increasingly expansive ideal. Engages with various fields of discourse to see how factors such as medicalization, neoliberalism, and colonization have shaped the perceptions and presentations of transness. Also navigates how art, education, and activism continue to guide a cultural shift regarding transness.

CMMU 93 - Field Study (5)

Supervised work in a community-based setting conducted under the guidance of a faculty member. Students submit petition to sponsoring agency.

CMMU 93F - Field Study (2)

Supervised work in a community-based setting conducted under the guidance of a faculty member. Students submit petition to sponsoring agency.

CMMU 93G - Field Study (3)

Supervised work in a community-based setting conducted under the guidance of a faculty member. Students submit petition to sponsoring agency.

CMMU 99 - Tutorial (5)

Individual directed study for lower-division undergraduates.

CMMU 99F - Tutorial (2)

Individual directed study for lower-division undergraduates.

Upper-Division**CMMU 101 - Communities, Social Movements, and the Third Sector (5)**

Engages with crosscutting ideas and concepts central to the major including constructions of community in social-change efforts and the institutionalization of social movements in third-sector organizations. Deepens students' understanding of the opportunities and obstacles embedded in various avenues of social action.

Prerequisite: Enrollment is restricted to sophomore, junior, and senior community studies majors and proposed majors.

CMMU 102 - Preparation for Field Studies (5)

A practicum to prepare students for field study. Course must be successfully completed prior to the six-month field study.

Prerequisite(s): CMMU 10; CMMU 101; satisfaction of the Entry Level Writing and Composition requirements; submission of the signed Goals and Objectives form; and completion of the declaration of major process. Enrollment restricted to community studies majors.

CMMU 103 - Field Study Practicum (2)

A practicum in social change work in which the students works for a social change organization on a part-time basis. Concurrent enrollment in CMMU 102 is required.

CMMU 105A - Field Study (5)

Full-time independent field study in an approved off-campus setting with onsite supervision by the sponsoring organization and regular distanced supervision by campus faculty.

Enrollment is restricted to community studies majors upon completion of the required preparatory coursework.

Prerequisite(s): CMMU 102. (Formerly CMMU 198, Independent Field Study.)

CMMU 105B - Field Study (5)

Full-time independent field study in an approved off-campus setting with onsite supervision by the sponsoring organization and regular distanced supervision by campus faculty.

Enrollment is restricted to community studies majors upon completion of the required preparatory coursework.

Prerequisite(s): CMMU 102. (Formerly CMMU 198, Independent Field Study.)

CMMU 105C - Field Study (5)

Full-time independent field study in an approved off-campus setting with onsite supervision by the sponsoring organization and regular distanced supervision by campus faculty.

Enrollment is restricted to community studies majors upon completion of the required preparatory coursework.

Prerequisite(s): CMMU 102. (Formerly CMMU 198, Independent Field Study.)

CMMU 107 - Analysis of Field Materials (5)

A seminar for students who have completed a full-time field study. Devoted to the systematic analysis of field materials, integrating appropriate concepts and relevant literature, as well as utilizing the experience of other students. (Formerly course 194.)

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, CMMU 198.

Enrollment is restricted to community studies majors.

CMMU 130 - Community Organizing Principles and Practice (5)

Community organizing brings people together in pursuit of self-determination in one or several realms of their lives. This course explores the history, philosophy, goals and accomplishments of community organizing and introduces students to practical community organizing skills.

CMMU 132 - American Cities and Social Change (5)

Examines the historical development of and contemporary conditions within U.S. cities by focusing on social and economic restructurings of cities, cultural and political transformations, and spatial reorganizations of the urban landscape. Goal is understanding the changing nature of urban experience.

CMMU 133 - Making California: Landscapes, People, Politics, Economy (5)

Examines key moments in the development of California to provide understanding of the challenges and opportunities facing California today. Particular focus is given to abiding tensions around wealth and poverty, opportunity and exclusion, and progressive and conservative politics.

CMMU 134 - No Place Like Home (5)

Examines the class and race dynamics of the housing market and public policy, asking what kinds of housing get built, where it gets built, and for whom it is (or is not) built--and, crucially, why. Questions how homelessness became normalized in contemporary society.

CMMU 137 - Communities and Climate Change (5)

For many communities the impacts of global warming, rising sea levels and environmental degradation compound already existing systemic racial, class, and gender inequalities. How do we understand the relationships between people and the environment? How are movements for social and ecological justice (dis)connected? This class considers how and why communities, activists and organizations press for alternatives through case studies from the U.S. environmental justice movement and related local and global struggles for food sovereignty, Indigenous rights and climate justice.

CMMU 141 - Political Justice in Theory and Practice (5)

Examines how markets operate within the political economy of contemporary capitalism to generate myriad and often chronic

forms of economic and social inequality in the United States. Explores different approaches to addressing inequality within the multi-faceted economic justice movement. (Formerly Political Economy of Inequality.)

Prerequisite: Enrollment is restricted to community studies majors and proposed majors during First Pass enrollment.

CMMU 143 - Wal-Mart Nation (5)

Examines origins and growth of Wal-Mart stores as powerful guides to understanding dynamics of contemporary global political economy and, relatedly, the changing fortunes of global social classes.

CMMU 145 - Global Capitalism: a History of the Present (5)

Provides an overview of the history of capitalism in order to understand current crises within the global political economy. Gives particular attention to the origin, character, and consequences of neoliberalism. (Formerly Globalization and Its Discontents.)

CMMU 148 - The Problem with Solutions (5)

"Solutionism" encourages college students to tackle the world "grand challenges" in areas such energy and resources, food and agriculture, education and literacy, or global health, with "innovative" technologies or program design. Rarely, however, are they encouraged to learn more about the problems they are trying to solve. Course examines contemporary solutionism, with a specific focus on agriculture and food, in order to recognize and understand its contexts, cultures, and consequences for social and ecological justice.

CMMU 149 - Political Economy of Food and Agriculture (5)

Examines key concepts in agrarian political economy; the historical development of the world food system; and a selection of contemporary issues related to food production, consumption, distribution, and regulation.

CMMU 151 - Sex, Race, and Globalization (5)

Examines globalization by attending to shaping forces of sexuality, gender, and race. Foregrounds Third World feminist theories, social movements. Topics include sexual and racial dynamics of free trade and labor fragmentation; global sex trades; HIV/AIDS politics in the South and North; transnational LGBT/queer politics.

CMMU 156 - Politics of Food and Health (5)

Critically examines contemporary debates about market and policy approaches to improve nutrition and dietary health and to address issues, such as food insecurity, obesity, and malnutrition.

CMMU 157 - Ageism and Activism (5)

Introduces students to gerontology, the study of aging. Taking a multidisciplinary approach, critically examines the theories, stereotypes, and realities of worldwide demographic transition and considers the many interesting implications for organizing social and personal life.

CMMU 160 - Public Health (5)

Examination of community activism to address health issues: examples are drawn from a range of concerns, e.g., environmental racism, prison conditions, feminist health matters, the AIDS epidemic, violence, and alcoholism. Special attention is given to the social frameworks of health and to the utilization of social and political strategies for improving community well-being.

CMMU 161 - Gender Health and Justice (5)

Critically examines concrete aspects of health in U.S. social and political contexts, emphasizing how gendered interpretations and practices construct and affect health equity and the practices of health care.

CMMU 162 - Community Gardens and Social Change (5)

Examines history, theory, and practice of community gardening, emphasizing contemporary garden projects using the transformative power of direct contact with nature to effect social change. Aims include understanding the nonprofit sector's response to social problems with novel programs and practices.

CMMU 163 - Health Care Inequalities (5)

Examines system and non-system that is American health care with special attention to inequalities in access, financing, and quality of care. Covers concepts such as equality, fairness, and need as well as community organizing and community building for health.

CMMU 164 - Health Justice in Conflict (5)

Explores three case studies to address critical themes of healthcare inequalities in the context of conflict: the legal battle of Ecuadorians against Texaco/Chevron; the struggle of comfort women during World War II; and chemical saturation in Iraq.

CMMU 165 - Community Analysis for Global Health (5)

Practical, skill-building course that starts from the premise that while all communities value health, different communities develop distinctive understandings of what health means to them and how best to achieve it given their specific environments and economies. Course focuses on health justice from a political economy perspective, analyzing how health is shaped by the interaction of multiple societal forces, including who holds power and what steps marginalized groups have taken to achieve more just distributions of resources. By studying community health, across multiple communities in a variety of locations, students learn how to be effective agents of global health equity.

CMMU 167 - Special Topics in Health Equity (5)

Special topics course in the field of health equity that offers focused content and/or perspectives within a field of study already central to the community studies curriculum, in this case public health and health equity. Specific course content varies with instructor.

CMMU 186 - Food and Agriculture Social Movements (5)

Examines the primary ways in which activists are attempting to resist, provide alternatives to, and/or transform aspects of the food system using social and environmental justice frameworks to evaluate such activism. Topics explored include organic farming, food charity, fair trade, relocalization, and farmworker organizing.

CMMU 189 - Mentoring in Community Studies (5)

Each student serves as a facilitator for small discussion groups in connection with core community studies courses. Facilitators complete course readings and meet with instructor as a group to discuss the teaching process. May not be counted toward upper-division major requirements. Prerequisite(s): prior course work in the major.

CMMU 191 - Student Volunteer Internship (3)

Course bridges Santa Cruz and university communities through students organizing volunteer opportunities and charitable events. Students contribute 10 hours per week on and off campus, including outreach, event-planning, and database maintenance; supplemented by reading and biweekly discussions. Enrollment is by permission of instructor after application and interview.

CMMU 192 - Directed Student Teaching (5)

Teaching of a lower-division seminar, course 42, under faculty supervision. Students submit petition to sponsoring agency. Approval by the Committee on Educational Policy the prior quarter.

CMMU 193 - Field Study (5)

Supervised work in a community-based setting conducted under the guidance of a faculty member. Students submit petition to sponsoring agency.

CMMU 193F - Field Study (2)

Supervised work in a community-based setting conducted under the guidance of a faculty member. Students submit petition to sponsoring agency.

CMMU 193G - Field Study (3)

Supervised work in a community-based setting conducted under the guidance of a faculty member. Students submit petition to sponsoring agency.

CMMU 195A - Senior Thesis (5)

Individual study with a faculty member to complete the senior thesis.

CMMU 195B - Senior Thesis (5)

Individual study with a faculty member to complete the senior thesis.

CMMU 195C - Senior Thesis (5)

Individual study with a faculty member to complete the senior thesis.

CMMU 199 - Tutorial (5)

Advanced directed reading and research for the serious student.

CMMU 199F - Tutorial (2)

Advanced directed reading and research for the serious student.

Graduate**CMMU 297 - Independent Study (5)**

Either study related to a course being taken or a totally independent study. Designed for graduate students. Students submit petition to sponsoring agency.

CMPM - COMPUTATIONAL MEDIA**Lower-Division****CMPM 25 - Introduction to 3D Modeling (5)**

Introduces theory and techniques of 3D computer graphics. Topics include: capabilities of modern graphics hardware; 3D coordinate spaces; modeling with polygons; NURBS and subdivision surfaces; applying textures and materials; lighting; and simple effects. Students develop proficiency in 3D modeling via lectures and assignments focused on the use of a 3D modeling tool.

CMPM 26 - Introduction to 3D Animation (5)

Introduces theories and techniques of 3D computer animation. Topics include: character animation; rigging; simulation of cloth, liquids, and fire; motion capture; rendering; and editing animated scenes. Students develop proficiency in 3D animation via lectures and assignments focused on the use of a 3D animation tool and use of motion-capture software.

Prerequisite: Prerequisite(s): CMPM 25.

CMPM 27 - Fundamentals of Substance Designer and Painter (5)

Introduction to the development of physically based materials in Substance Designer and Substance Painter. These are then applied to a range of character and machine models within either the Blender or Maya 3D modeling applications.

Prerequisite: Prerequisite(s): CMPM 25 or by permission of the instructor.

CMPM 35 - Data Structures for Interactive Media (5)

Introduction to common data structures, algorithms that operate on them, and techniques for implementation. Uses digital authoring of interactive media as a frame to motivate asymptotic (big-O) analysis of design scalability. Students will program in a strongly typed language.

Prerequisite: Prerequisite(s): CSE 30.

CMPM 80A - Accessible Games (5)

Overview of the physical, psychological, cultural, and psychosocial aspects of disability and how they impact game

play. Discusses implications for universal and accessible game design.

CMPM 80K - Foundations of Video Game Design (5)

A generally accessible course in which students explore how video games (and games generally) shape experiences and express ideas. Students develop novel games, engage in game interpretation, and survey related topics (e.g., game history, technology, narrative, and ethics) through lectures and readings. Programming experience is not required.

CMPM 80L - Entrepreneurial Organization and Leadership (5)

Provides a framework for leadership in entrepreneurial organizations. Topics include leading with authenticity, motivation and personality, storytelling, teamwork and management, organizational culture and processes. Learning is integrated with practice through deep engagement with entrepreneurial leaders and a time-intensive entrepreneurial project. (Formerly Technology and Information Management 80L.)

CMPM 94 - Group Tutorial (5)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Students submit a petition to the sponsoring agency.

CMPM 94F - Group Tutorial (2)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Students submit a petition to the sponsoring agency.

Upper-Division

CMPM 120 - Game Development Experience (5)

Teaches the concrete programming and collaboration skills associated with making a digital game from start to finish, including but not limited to: establishing a team, concepting, storyboarding, prototyping, producing, and testing a game for release. Students are organized into groups and work together to create and produce a playable game. This course is taught in conjunction with ARTG 120 which covers the skills required to design and critique digital games.

Prerequisite: Prerequisite(s): CMPM 80K; and FILM 80V; and CSE 15 and CSE 15L or CSE 30 or CMPM 35; and ARTG 80G or ARTG 80H or ARTG 80I; and concurrent enrollment in ARTG 120. Enrollment is restricted to juniors and seniors or by permission of the instructor.

CMPM 121 - Game Technologies (5)

Introduction to construction of games using game engine technology, using a specific game engine as a focus. Covers major game engine features: input, collision, animation, model import, lighting, camera, rendering, textures, particle systems. Introduction to a specific game scripting language, custom game logic, game programming patterns.

Prerequisite: Prerequisite(s): CMPM 120.

CMPM 131 - User Experience for Interactive Media (5)

Theories and practices for approaching the design problems of interactive media holistically, beyond usability and accessibility. Includes hands-on learning, application of human-centered design and evaluation skills in group projects, and peer critique.

Prerequisite: Enrollment is restricted to juniors, seniors, and graduate students.

CMPM 132 - Interaction Design Studio (5)

Practice-based interaction design studio course. Students learn about design-led approaches to Human-Computer Interaction through participating in group projects. Course offers introductions to design methods and actionable strategies to do interaction design work and design-led technology research.

Prerequisite: Enrollment is restricted to juniors, seniors, and graduate students.

CMPM 146 - Game AI (5)

Course provides a comprehensive introduction to the use of artificial intelligence (AI) in computer games. Building on fundamental principles of AI, course explains how to create non-player characters (NPCs) with progressively more sophisticated capabilities.

Prerequisite: Prerequisite(s): CSE 101; familiarity with C++. Enrollment is restricted to sophomores, juniors, seniors, and graduate students.

CMPM 147 - Generative Design (5)

Introduces generative methods for design. Uses algorithmic techniques to generate and evaluate game content (images, sounds, map designs) along with mechanics and progression systems. Search-based and learning-based techniques with connections to artificial intelligence are also covered.

Prerequisite: Prerequisite(s): CMPM 120.

CMPM 148 - Interactive Storytelling (5)

Covers a range of design approaches and technologies including storytelling in games, interactive fiction, interactive drama, and artificial intelligence-based story generation. Through a mixture of readings, assignments, and project work, students explore the theoretical positions, debates, and technical and design issues arising from these approaches.

Prerequisite: Prerequisite(s): CSE 101 or CMPM 35. Enrollment is restricted to juniors and seniors.

CMPM 150 - Creating Digital Audio (5)

Introduces digital sound recording and editing technologies, sound synthesis, and concepts in sound design for media production. Covers the basics of sound capture, microphones, audio manipulation and editing, effects, sound formats, mixing and dynamics, synthesizers, audio software, and game audio.

Prerequisite: Enrollment is restricted to sophomores, juniors, and seniors.

CMPM 151 - Algorithmic Music for Games (5)

Introduces compositional techniques and procedural audio as exhibited in the sound and music of video games. Surveys different styles of music implemented in video games and associated compositional approaches. Students develop skill in procedural audio via a series of workshops and assignments.

Prerequisite: Prerequisite(s): CSE 14 and CSE 14L, or CSE 11.

CMPM 152 - Musical Data (5)

Surveys the relationship between music and data as exhibited in industry and research implementations of sonification and music information retrieval. Students introduced to various styles and algorithms of sound analysis and modeling and develop skills to program unique approaches in this area.

Prerequisite: Prerequisites: CMPM 35 or CMPM 120 or CMPM 150 or CMPM 151 or by permission of instructor. Enrollment is restricted to juniors, seniors, and graduate students.

CMPM 163 - Game Graphics and Real-Time Rendering (5)

Introduces real-time, hardware-accelerated graphics programming suitable for game development, visual effects, and interactive multimedia projects. Emphasizes contemporary shader-programming techniques and developing custom effects using game engines and multimedia software.

Prerequisite: Prerequisite(s): CMPM 120 (exceptions granted in special cases with permission of the instructor).

CMPM 164 - Game Engines (5)

Covers the graphic elements in computer games. Topics include modifying, optimizing, adding components, and building a game engine. Course evaluation based on exams and several programming projects, including a game built using the student's game engine.

Prerequisite: Prerequisite(s): CSE 160 and CSE 160L. Concurrent enrollment in CMPM 164L is required.

CMPM 164L - Game Engines Lab (2)

Provides hands-on experience in using, designing, and building game engines. Students also explore different special effects, such as particle systems, spring systems, and game physics.

Prerequisite: Concurrent enrollment in CMPM 164 is required.

CMPM 169 - Creative Coding (5)

Surveys seminal and contemporary artworks and interactive installations that utilize and critically analyze new media, new technologies, and new algorithms. Students introduced to creative coding practices and encouraged to emulate existing digital arts techniques and to develop their own computational arts projects.

Prerequisite: Prerequisites: CMPM 35 or CMPM 120 or CMPM 163 or by permission of instructor. Enrollment is restricted to juniors, seniors, and graduate students.

CMPM 170 - Game Design Studio I (5)

First of a three-course capstone sequence for the computer game design program. Students work in teams to develop a comprehensive game design for a substantial computer game, including detailed storyline, level design, artistic approach, implementation technologies, and art-asset pipeline. Emphasis placed on creating novel, artistic game design concepts. Includes design reviews and formal presentations. Companion lectures cover advanced topics in game design, game programming, and software project management.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; CMPM 120, ARTG 120 and CSE 111. Enrollment is restricted to Computer science: computer game design majors.

CMPM 171 - Game Design Studio II (7)

Second of a three-course capstone sequence for the computer game design program. Students work in teams on the software design, implementation, and testing of the computer game designed in CMPM 170. Includes design reviews, progress reviews, and formal presentations. Companion lectures cover topics in software engineering, including design, testing, and project management. Game design and game programming also covered.

Prerequisite: Prerequisite(s): CMPM 170 and CMPM 176 and one computer game engineering elective. Enrollment is restricted to computer science: computer game design majors.

CMPM 172 - Game Design Studio III (7)

Third of a three-course capstone sequence for the computer game design program. Students work in teams on the software design, implementation and testing of the computer game designed in courses 170 and 171. Includes progress reviews and formal presentations. Companion lectures cover topics in software engineering, including user and software testing, release engineering and project management; also covered are game design and game programming.

Prerequisite: Prerequisite(s): CMPM 171. Enrollment is restricted to Computer science:computer game design major.

CMPM 176 - Game Systems (5)

Presents game design as the interplay of multiple interacting game systems. Surveys various game systems: movement, combat, reward, economic, logistics, quest, information visibility, narrative. Students explore systems via study, design, and play of board, card, and computer games.

Prerequisite: Prerequisite(s): CMPM 80K.

CMPM 177 - Creative Strategies for Designing Interactive Media (5)

Surveys tactical, structural, contextual, and other methods to enhance creativity and innovation in the design of games and other interactive media. Investigates strategies for creativity and innovation drawn from diverse fields, including interactive affordances, narrative and poetics, biology, contextual inquiry, and design research. To innovate in a field of fixed genres is

challenging: the allure of modeling exemplars is strong. Although imitation can be successful in the marketplace, the most creative action occurs on the leading edge of change. Innovation benefits from strategies and methods that are directly aimed at exploring new perspectives and structures to learn through the process of discovery.

Prerequisite: Enrollment is restricted to juniors and seniors.

CMPM 178 - Human-Centered Design Research (5)

Students move through a rigorous design-research process involving skills and principles in human-centered design research as well as selected formal research methods. They learn to use tools for ideation, human-centered qualitative research, domestic probes, mock-ups, and prototypes.

Prerequisite: Enrollment is restricted to juniors, seniors, and graduate students.

CMPM 179 - Game Design Practicum (5)

Provides the opportunity to practice the creation of novel computer games. Students learn a new game-making technology, then create three games using this technology.

Prerequisite: Prerequisite(s): CMPM 120 and CMPM 80K.

CMPM 194 - Group Tutorial (5)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Students submit a petition to the sponsoring agency.

CMPM 194F - Group Tutorial (2)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Students submit a petition to the sponsoring agency.

CMPM 195 - Senior Thesis Research (5)

Students submit a petition to the sponsoring agency.

CMPM 195F - Senior Thesis Research (2)

Intended for majors. Students submit a petition to the sponsoring agency.

CMPM 198 - Individual Study or Research (5)

Students submit petition to sponsoring agency.

CMPM 198F - Individual Study or Research (2)

Intended for majors. Students submit petition to sponsoring agency.

CMPM 199 - Tutorial (5)

For fourth-year students majoring in computational media. Students submit a petition to the sponsoring agency.

CMPM 199F - Tutorial (2)

For fourth-year students majoring in computational media. Students submit a petition to the sponsoring agency.

Graduate

CMPM 201 - Introduction to Computational Media (5)

Provides a broad foundation in the history, theory, and contemporary practice of computational media, examining its roots in a variety of fields and current structures of participation. Also covers a selection of key critical lenses for understanding computational media.

Prerequisite: Enrollment is restricted to computational media graduate students, or by permission of the instructor.

CMPM 202 - Computation Media Research (5)

Overview of computational media research strategies. Includes case studies of how particular projects were defined and completed and how interdisciplinary concerns have been successfully integrated. Considers the expressive and authorial affordances of different system architecture approaches.

Prerequisite: Prerequisite(s): CMPM 201, or by permission of the instructor. Enrollment is restricted to graduate students.

CMPM 203 - Computational Media Methods (5)

Overview of major methods in computational media research. Includes non-numerical methods such as playtesting, arts critique, ethnographic observation, and humanistic interpretation. Also includes numerically oriented methods such as survey instruments, data mining, user experiments, and characterizing expressive/generative spaces.

Prerequisite: Enrollment is restricted to Computational Media graduate students.

CMPM 204 - Computational Media Project Definition (5)

Students define the topic, approach, and scope for an M.S. thesis or project. Includes discussion of successful past projects and theses, visits from faculty presenting open problems, reviews of related literature, topic and timeline presentations, and critiques.

Prerequisite: Enrollment is restricted to computational media graduate students, or by permission of the instructor.

CMPM 206 - Computational Media Research Preparation (2)

Covers skills for finding relevant literature for a novel research topic, integrating that literature, and communicating the results. Also covers how to select work for a research portfolio, present that work, and describe contributions. Enrollment is by permission of the instructor. Prerequisite(s): CMPM 201, CMPM 202, and CMPM 203 for an understanding of media creation and computer programming; good standing in the Ph.D. program. Enrollment is restricted to graduate students.

CMPM 235 - User Evaluation of Technology (5)

Presents a variety of evaluation methodologies to assess usability, acceptance, and effectiveness of technology with the intended users. Combines lectures and exercises for students to gain firsthand experiences of these methodologies with real users.

Prerequisite: Enrollment is restricted to graduate students. Seniors may enroll with completion of CSE 165.

CMPM 237 - Advanced Topics in Human-Robot Interaction (5)

Study of current topics in human-robot interaction design and research. Topics vary, but are expected to include how people think, act, and behave around robotic agents; telepresence and teleoperated robotics; applications of human-robot systems; collaborative robotics; and social robotics.

Prerequisite: Enrollment is restricted to graduate students.

CMPM 243 - Social Computing Research: Design, Algorithms, and Incentives (5)

Provides an interdisciplinary view of computational systems and human interaction, with an emphasis on human-computer interaction and algorithmic economics. Students learn about seminal and cutting-edge research contributions and methodologies, and carry out a quarter-long research project. (Formerly Technology and Information Management 243.)

Prerequisite: Prerequisite(s): A background in either mathematical proofs or user-centered design and programming. Enrollment is restricted to graduate students; undergraduates may enroll by permission of the instructor.

CMPM 244 - Artificial Intelligence in Games (5)

The use of AI techniques to enable new player interactions, game mechanics, and genres. Combines elements from academic AI and machine learning with industry game AI techniques. Includes lecture and paper discussions as well as AI programming exercises and projects.

Prerequisite: Enrollment is restricted to graduate students; others by permission.

CMPM 248 - Interactive Storytelling (5)

Covers wide range of practices including hypertext, interactive fiction, embedded narratives in games, interactive drama, and artificial intelligence-based story generation. Through a mixture of readings, assignments, and project work, explores the theoretical positions, debates, and technical and design issues arising from these different approaches.

Prerequisite: Enrollment is restricted to graduate students.

CMPM 265 - Generative Methods (5)

In-depth exploration of algorithms for the automated generation of 2D and 3D models and content. Covers multiple approaches, including noise, grammars, genetic algorithms and programming, parametric design, and answer-set programming. Includes application of techniques to computer-game content and level design.

Prerequisite: Enrollment is restricted to graduate students.

CMPM 268 - Immersive Analytics (5)

Investigates how new immersive display technologies and interaction techniques can support analytical reasoning and decision making in a variety of contexts.

Prerequisite: Enrollment is restricted to graduate students.

CMPM 269 - Machine Learning for Creativity and Design (5)

Introduces contemporary techniques in deep learning focusing on the application of these techniques to a range of tasks related to art and design outputs.

Prerequisite: Prerequisites: CMPM 202 or by permission of the instructor. Enrollment is restricted to graduate students.

CMPM 280C - Computational Media Seminar (2)

Graduate seminar with speakers from academia and industry. Covers state of the art research and industry trends in Computational Media and related areas.

Prerequisite: Enrollment is restricted to computational media and games and playable media graduate students.

CMPM 280F - Seminar in Creative Coding and Computational Media (2)

Covers advanced topics and current research in creative coding as it intersects computational media. Focuses on student presentations and seminar participation. Enrollment is restricted to graduate students and by permission of instructor. This class can be taken for Satisfactory/Unsatisfactory credit only.

CMPM 280G - Seminar in Generative Methods (2)

Weekly seminar covering advanced topics and current research in generative methods--the field focused on algorithms for creation of 2D and 3D models and content.

Prerequisite: Enrollment is restricted to graduate students.

CMPM 280H - Seminar in Human-Computer Interaction and Computational Media (2)

Covers advanced topics and current research in human-computer interaction as it intersects computational media. Focuses on student presentations and seminar participation. Enrollment restricted to graduate students and by permission of the instructor.

CMPM 280I - Human Computer Interaction Seminar (2)

Ongoing participatory seminar toward staying informed about the current state of the art in Human Computer Research, both within the Computational Media department, as well as in the broader field. Course consists of weekly lectures and discussion. Graduate students will take part in giving presentations.

Prerequisite: Enrollment restricted to computational media and games and playable media graduate students.

CMPM 280K - Seminar in Interactive Systems for Individuals with Special Needs (2)

Covers advanced topics and current research in interactive systems for individuals who have special needs. Focuses on student presentations and seminar participation.

Prerequisite: Enrollment is restricted to graduate students.

CMPM 280P - Seminar in Player Experience and Modeling (2)

Covers advanced topics and current research in player experience and modeling. Delves into topics related to: artificial intelligence, psychology, data science, as well as computer human interaction as they intersect with games and player experience. Course is conducted as a studio/seminar, where students read and analyze previous research within this area. Students are asked to present and discuss current state of the art of research in the area of player experience and modeling and then develop their own research within this area. Through interaction with the instructor and other colleagues within the class, students work toward refining their research. This course can be taken for Satisfactory/Unsatisfactory credit only.

Prerequisite: Enrollment is restricted to graduate students.

CMPM 280R - Topics in Human-Robot Interaction (2)

Focuses on human-centered design and research approaches to the development of robotic technologies. Students read primary research papers, examine prototype robotic systems, and build upon those materials to lead group discussions, propose research projects, and conduct HRI research.

Prerequisite: Enrollment is restricted to graduate students.

CMPM 280S - Seminar Topics (2)

Weekly seminar series of current research on a special topic in information systems and technology management. The theme of research presented throughout the course selected by the instructor. Topics may include, but are not limited to, knowledge planning, new product development and management of technology. Enrollment with permission of instructor. (Formerly Technology and Information Management 280S.)

CMPM 280W - Seminar in Digital Media (2)

Covers advanced topics and current research in digital media—the interdisciplinary field at the intersection of computer science, media authoring, and models of interpretation from the humanities and social sciences. Focuses on student presentations and seminar participation.

Prerequisite: Enrollment is restricted to graduate students.

CMPM 280X - Expressive AI (2)

Weekly seminar covering topics of current research in artificial intelligence applied to interactive art and entertainment, including computer games. Enrollment by permission of instructor. Enrollment restricted to graduate students.

CMPM 290A - Topics in Computational Media (5)

Students learn about a current research area in computational media and make a contribution. Each course offering focuses on a different aspect of technical, creative, and/or interpretive work in the field.

Prerequisite: Enrollment is restricted to computational media graduate students.

CMPM 290J - Playable Media (5)

Focuses on media, such as computer games, that invite and structure play. Work includes building and critiquing a series of prototypes; studying major examples in the field; and discussing both theoretical and practice-oriented texts. Enrollment by permission of instructor. Enrollment restricted to graduate students.

CMPM 290K - Social and Emotional Approaches to Human Computer Interaction (5)

Focuses on enhancing social and emotional capabilities and qualities in interactive systems. Students read research, look at sample systems, and engage in evaluation, design, and prototyping exercises. A research project and helping to lead class discussions are also required.

Prerequisite: Enrollment is restricted to graduate students.

CMPM 290P - Topics in Computational Cinematography (5)

Focuses on discussion of recent advances in visual storytelling in graphical environments. Major topics covered are: intelligent camera control, shot-compositions, lighting design, interactive storytelling, and computational techniques associated with these applications. Class consists of in-class discussions and student presentations of research papers and a final student project.

Prerequisite: Enrollment is restricted to graduate students.

CMPM 297A - Independent Study or Research (5)

Independent study or research under faculty supervision. Although this course may be repeated for credit, not every degree program will accept a repeated course toward degree requirements. Students submit petition to sponsoring agency.

CMPM 297B - Independent Study or Research (10)

Independent study or research under faculty supervision. Although this course may be repeated for credit, not every degree program will accept a repeated course toward degree requirements. Students submit petition to sponsoring agency.

CMPM 297C - Independent Study or Research (15)

Independent study or research under faculty supervision. Although this course may be repeated for credit, not every degree program will accept a repeated course toward degree requirements. Students submit petition to sponsoring agency.

CMPM 297F - Independent Study or Research (2)

Independent study or research under faculty supervision. Although this course may be repeated for credit, not every degree program will accept a repeated course toward degree requirements. Students submit petition to sponsoring agency.

CMPM 299A - Thesis Research (5)

Thesis research conducted under faculty supervision. Although this course may be repeated for credit, not every degree program will accept a repeated course toward degree requirements. Students submit petition to sponsoring agency.

CMPM 299B - Thesis Research (10)

Thesis research conducted under faculty supervision. Although this course may be repeated for credit, not every degree program will accept a repeated course toward degree requirements. Students submit petition to sponsoring agency.

CMPM 299C - Thesis Research (15)

Thesis research conducted under faculty supervision. Although this course may be repeated for credit, not every degree program will accept a repeated course toward degree requirements. Students submit petition to sponsoring agency.

COWL - COWELL COLLEGE**Lower-Division****COWL 1 - Academic Literacy and Ethos: Imagining Justice (5)**

Teaches foundational concepts for intellectual exploration and personal development within an academic community: analysis, critical thinking, metacognition, engagement with others across difference, and self-efficacy. Examines the emergence and development of key concepts of justice including procedures, rights, and reparation.

Prerequisite: Enrollment is restricted to first-year college members.

COWL 11E - Leadership Spring Break Intensive: Backpacking the Canyons of Southern Utah (2)

Experiential Leadership Program course focusing on tools to build a high functioning team that has the confidence and skill to work together, solve complex problems, and navigate challenges to achieve a shared goal. Includes a 10-day wilderness expedition as a testing ground to practice and apply new team skills. Includes leadership development, and learning about good expedition and team behavior. Enrollment is by instructor permission. (Formerly offered as STEV 13.)

COWL 1A - Introduction to University Life and Learning (1)

Orientation to and exploration of the nature of the liberal arts, and of learning at research universities. Topics include: academic planning for upper-division coursework; enrollment processes; and understanding pathways to degree completion; UCSC resources that support health and well-being strategies for academic success; the cultivation of just communities; the prevention of sexual harassment and violence; campus conduct policies; awareness of risks associated with drug and/or alcohol use; and an introduction to traditions of community-engaged learning, ground-breaking research, and interdisciplinary thinking that define a UC Santa Cruz degree. This course can be taken for Pass/No Pass grading only.

Prerequisite: Enrollment is restricted to entering first-year Cowell College students.

COWL 70A - Introduction to Book Arts (5)

Students learn techniques of bookbinding, construction, and design, and fundamentals of letterpress printing. Enrollment is by permission of instructor.

COWL 70B - Intermediate Book Arts (5)

Learn fundamental skills in fine letterpress printing, including hand typesetting and instruction in the operation of printing presses. Basic typography explored as students design and print a small edition of a selected text.

Prerequisite: Prerequisite(s): COWL 70A or by permission of instructor.

COWL 10 - Becoming a Successful Student (5)

An interactive approach to effective studying, note-taking, critical thinking, and exams. Also explored: time management; good communication with staff and faculty; major and career exploration; and use of campus resources. Enrollment priority given to first-year students and sophomores.

COWL 11A - Experiential Leadership Program Core Course: Tools for Leadership and Conflict Resolution (2)

Students gain skills and confidence to lead groups; develop a leadership mindset; build tools for communication, conflict resolution, and receiving feedback; cultivate an inclusive and welcoming environment. (Formerly offered as STEV 11A.)

COWL 11B - ELP Core Course: Leadership From the Inside Out, Networking and Professionalism (2)

Gain insights, tools, and confidence to identify and pursue goals, dreams, and aspirations. This Experiential Leadership Program course focuses on developing greater self-awareness, and practical tools for getting where you want to go. Includes an all day adventure hike. No experience necessary. (Formerly offered as STEV 11B.)

COWL 11C - ELP Core Course: Tone-Setting and Leading with Cultural/Emotional Intelligence (2)

Experiential Learning Program course in which students gain insights and confidence to work with multicultural and global teams. Focuses on developing a mindset and frameworks that support people to work effectively with one another. Includes an all-day sea kayak adventure (funding dependent). No experience necessary.

COWL 11D - ELP Elective Course: Risk Management and Social Justice Through the Lens of Outdoor Leadership (2)

Although applicable to any setting, this Experiential Leadership Program (ELP) course explores topics of risk management and social justice through the lens of outdoor leadership. Students gain tools and insights to cultivate a safe and inclusive environment. Includes a weekend backpack trip (funding dependent). No experience necessary.

COWL 12 - Public Speaking (5)

This introductory level seminar is designed to reduce anxiety and increase competence and confidence in a variety of public speaking situations. While providing some theory, this seminar emphasizes the practice of composing and delivering speeches, including formal, informal, and extemporaneous occasions.

Prerequisite: Enrollment is restricted to college members during priority enrollment.

COWL 39 - Brain, Mind, and Consciousness (3)

An interdisciplinary introduction to the study of the brain, mind, and consciousness. Topics include the philosophy of mind, neuroscience, cognition, and social psychology, and their applications in fields such as health science, technology, and social development.

COWL 40 - Near-Death Experiences: Evidence and Inference in the Post-Modern World (5)

Explores evidence and inferences from existing literature surrounding near-death experiences. Uses a multidisciplinary approach to investigate concepts, such as consciousness, aging, life, and death.

COWL 50 - Library Skills for the Digital Age (2)

Intended to enhance students' skills in using the most powerful learning tool in any university: the library. Topics: organization of the library; how to begin researching; search engine and database use; judging the quality of sources; using sources responsibly. Disciplinary focus changes from quarter to quarter.

Prerequisite: Enrollment is restricted to first-year and sophomore college members, or by permission of instructor.

COWL 52 - Personal Finance and Investing (5)

Overview of the financial responsibilities that young adults take on after college. Topics include: taxes, budgeting, student loans, credit, and investing in the stock market. Ubiquitous terms, such as 401(k), are defined, and financial principles are used to develop a framework for personal financial decision-making.

COWL 61 - Critical Journeys (2)

For publication in a Cowell literary journal, students substantively revise one of their fall quarter essays by studying a major work that influences, acknowledges, or further clarifies a required reading of the Cowell core course.

Prerequisite: Prerequisite(s): course 80A or 80B; enrollment is restricted to college members.

COWL 64 - Social Justice: Issues and Debates (2)

Focused followup on social justice topics and readings introduced in the Cowell core course. Allows first-year students to pursue social justice themes in greater depth. Students must have previously taken a Cowell core course (or equivalent).

Prerequisite: Enrollment is restricted to first-year students.

COWL 65 - Meaning, Paradox, and Love (5)

Mary Holmes--legendary founding faculty member of UCSC, keen observer, painter of mythic images, and profound thinker--had a visionary's insight into the mysteries of love, paradox, and meaning. This course explores her art, teaching, and wisdom.

COWL 70C - Advanced Book Arts (5)

Students learn fundamental skills in fine letterpress printing, including hand typesetting and instruction in the operation of printing presses. Basic typography explored as students design and print a small edition of a selected text.

Prerequisite: Prerequisite(s): COWL 70B or by instructor permission.

COWL 78 - Children, Technology, and Development (5)

First-year honors seminar focusing on current research and theory related to children and technology. Attention is given to the gaps between public opinion about the impact of technology on children and the actual evidence regarding such impacts. Topics may include how use of digital devices may influence children's thinking; how children learn to use new technologies; computer gaming and aggression; and how children's social development may be influenced by social media and other technology.

Prerequisite: Enrollment is restricted to College Scholar students.

COWL 82 - Good vs. Good (5)

Explores the world of philanthropy. Examines the different models of philanthropy to evaluate its strengths and weaknesses. Also examines what drives philanthropists to give. Enrollment by permission and restricted to College Scholar students.

COWL 83 - The Modern Metropolis: Paris, London, New York 1770-1860 (5)

A comparison of three great modern cities, with emphasis on their roles as incubators of new forms of art, spectacle, and entertainment; the specters of alienation, poverty, and crime during periods of explosive growth; and immigration and diversity as sources of cultural dynamism.

Prerequisite: Enrollment is restricted to Cowell and Crown Honors students.

COWL 84 - Chinese Approaches to Human Values (5)

Through study of primary sources in translation, considers a range of classic Chinese approaches to basic reflective questions about human experience, with special focus on issues of justice, social engagement, and meaning and authenticity in everyday life.

Prerequisite: Enrollment is restricted to College Scholars students.

COWL 85 - Introduction to Chinese Writing Systems (5)

Gateway course illuminating the operation of the writing systems of greater China. Intended for students who are curious about the world's longest continually used symbol set as well as for those who may be considering a serious commitment to learning the language.

COWL 86 - Leading Social Change (2)

Offers students the knowledge and skills required to lead diverse teams. Topics include the social-change model of leadership and principles of collaboration. Geared toward Cowell and Stevenson Residential Assistants, but students interested in the topics may take the course with permission from the instructor.

COWL 87 - The History of Time (5)

Examines the history of temporality or the human experience of time. Theoretical readings and primary sources are used to explore the ways that humans have related to the past, present, and future. Course focuses on research and writing methods.

Prerequisite: Enrollment is restricted to College Scholar students.

COWL 89 - Faculty Research Colloquium (2)

Introduction of UCSC as a research university, our notable researchers, and their work. Weekly discussions with UCSC faculty from a variety of disciplines.

Prerequisite: Enrollment is restricted to participants in the first-year scholars program.

COWL 93 - Field Study (5)

Various topics to be arranged. Students submit petition to sponsoring agency.

COWL 93F - Field Study (2)

Various topics to be arranged. Students submit petition to sponsoring agency.

COWL 94 - Group Tutorial (5)

A program of independent study arranged between a group of students and a faculty instructor. Students submit petition to sponsoring agency.

COWL 94F - Group Tutorial (2)

A program of independent study arranged between a group of students and a faculty instructor. Students submit petition to sponsoring agency.

COWL 99 - Tutorial (5)

Various topics to be arranged. Students submit petition to sponsoring agency.

COWL 99F - Tutorial (2)

Various topics to be arranged. Students submit petition to sponsoring agency.

Upper-Division**COWL 107 - Trust Rules: How to Tell the Good People from the Bad (2)**

Students learn practical tools and techniques for assessing trustworthiness, including your own, and applying these tools in a variety of situations. Integrating insights from practical experience, philosophy, and psychology, this course teaches us how to pay attention to red flags in relationships and ultimately develop a network of trustworthy people that will help us succeed in work and in our personal lives.

Prerequisite: Enrollment is restricted to college members or by permission of instructor.

COWL 110 - Introduction to Mock Trial (2)

Introduces Mock Trial, which is open to all students. Covers the basics of argumentation, cross and direct examinations, permissible evidence, witness testimony, and courtroom protocol. Special emphasis is on public speaking. Students write speeches for opening and closing arguments and create questions for witnesses. Students must read the Mock Trial handbook for examples and strategies. Each student has an opportunity for public speaking and creating a coherent legal argument.

Prerequisite: Enrollment is restricted to college members.

COWL 111 - Mock Trial Workshop (2)

Mock Trial teaches public speaking in the context of law. Students learn direct examination and cross examination strategies, characterization, and different ways to improve your public speaking skills. Class is open to everyone regardless of experience in Mock Trial. Class is also a way to gain experience for students considering joining the Mock Trial team.

COWL 118B - Words & Music: Poetry, Musical Theater, Opera (5)

Study of significant texts enhanced by music for performance. Topics vary annually. Course compares original texts in English translation with their adaptation to musical theater (*My Fair Lady*, *Oklahoma*, etc.) and opera (*Carmen*, etc.)

COWL 118C - Musical Theater in America (5)

Investigates the early years of musical theater by focusing on the arrival and spread of opera across the continental United States. Explores popular genres, media reception, discourses on race and art, and the way that opera transformed the American landscape. Students read important social, cultural and political histories of American opera, listen to recorded versions and watch several films. Class also features collaboration with the UCSC Opera Program to examine questions of performance.

COWL 122 - United Nations Contemporary Issues (2)

Introduces the Model United Nations through discussion of contemporary issues. Students learn parliamentary procedures and U.N. protocols, as well as how to work collaboratively to research and to present position papers. Students learn resolution writing, alliance building, and persuasive speech.

COWL 126 - Trajectories of Justice: Standing Rock, Climate Change, and Trump's Potential Impeachment (5)

Enables students to become expert on the potential impeachment of Donald Trump in the context of progressive American history, emphasizing his Neglect of Duty regarding global climate change through the lens of *The Native Uprising* against the Dakota Access Pipeline. (Formerly *The Trajectory of Justice in America*.)

COWL 138A - The Place of Higher Education in a Democratic

Society (5)

Centers around interviews of alumni and involves a reflective term paper on a specific topic having to do with the role of higher education in a democratic society. Teaches students how to conduct interviews.

Prerequisite: Prerequisite(s): COWL 80A or COWL 80B.

COWL 138B - Life Development (2)

Visits from alumni form the centerpiece of this course. In teams, students study the lives and the issues of the visitors. The aim is to reflect on the meaning of education in adult development.

Prerequisite: Prerequisite(s): COWL 80A or COWL 80B. Enrollment is restricted to sophomore, junior, and senior Cowell College members.

COWL 156M - Medical Ethics and Justice in Literature and Film (5)

Course approaches literature and literary devices in their capacity to address the patient's experience of illness, medical education and practice, and medical ethics and to understand and assess how considerations of justice impact these themes in medicine. Particular issues raised by a variety of topics are examined and discussed in the context of case examples as presented in literature and film, e.g., informed consent, the doctor-patient relation, withdrawing vs. withholding life-sustaining treatment, organ transplantation, health care reform, rationing/social justice, etc.

COWL 158A - Special Topics: Oral History (5)

Introduction to the art and science of conducting and oral history. Readings include books that offer both theoretical and practical insights. Students conduct interviews and construct oral histories, focusing on the alumni of Cowell College.

Prerequisite: Enrollment restricted to sophomore, junior, and senior college members.

COWL 161A - Bards to Bloggers: Literature and Technology in Transhistorical Focus (5)

Through study of ancient and contemporary forms (epics to e-literature), students study the connections that have tied literary reading and writing to specific technologies, including memory, the alphabet, pens, printing, radio, computing, the Internet, and handheld devices.

Prerequisite: Enrollment is restricted to junior and senior college members.

COWL 165 - Fundraising Practicum (3)

Covers the fundamental skills, ethics, and practices of crowd-sourced fundraising in the liberal arts. Students build a project portfolio that includes mission statement, donor-cultivation tools, and action reports. Enrollment is by permission of the instructor. Meet with the instructor to verify enrollment in a Giving Day campaign with liberal arts focus.

COWL 168 - Social Change (2)

How do you change the world, working alone and in concert with others? To find out, students work in groups with specific community partners who, in turn, help place students in social-change organizations in Santa Cruz County.

Prerequisite: Enrollment is restricted to college members.

COWL 174 - Global Leadership (3)

Students learn about leadership styles, how leaders work with constituent groups, build cooperation, and develop implementation plans. Students learn to consider how decision making is done, and what is best practice for best working in a variety of communities and cultures. Enrollment is restricted to those participating in Virtual Global Internships.

COWL 184A - Leadership and Institution Building (2)

Through lectures by senior administrators and student consensus-and-recommendation teams, students learn how leaders work with constituent groups, build cooperation, and develop implementation plans in an institution such as the University of California, specifically, UC Santa Cruz. Enrollment is restricted to undergraduates accepted in the Chancellor's Undergraduate Internship Program. Students submit applications winter quarter for the following academic year.

COWL 184B - Leadership and Institution Building (2)

Through lectures by senior administrators and student consensus-and-recommendation teams, students learn how leaders work with constituent groups, build cooperation, and develop implementation plans in an institution such as the University of California, specifically, UC Santa Cruz. Enrollment is restricted to undergraduates accepted in the Chancellor's Undergraduate Internship Program. Students submit applications winter quarter for the following academic year.

COWL 184C - Leadership and Institution Building (2)

Through lectures by senior administrators and student consensus-and-recommendation teams, students learn how leaders work with constituent groups, build cooperation, and develop implementation plans in an institution such as the University of California, specifically, UC Santa Cruz. Enrollment is restricted to undergraduates accepted in the Chancellor's Undergraduate Internship Program. Students submit applications winter quarter for the following academic year.

COWL 192 - Directed Student Teaching (5)

Teaching of a lower-division seminar under faculty supervision. (See COWL 42.) Upper-division standing required and a proposal supported by a faculty member willing to supervise.

COWL 193 - Field Study (5)

Program of study arranged between a group of students and an instructor, which may involve work with an off-campus or non-departmental agency (e.g., internship or field work). Interview

only; prior arrangement with instructor. Enrollment is restricted to juniors and seniors.

COWL 193F - Field Study (2)

Program of study arranged between a group of students and an instructor, which may involve work with an off-campus or non-departmental agency (e.g., internship or field work). Interview only; prior arrangement with instructor. Enrollment is restricted to juniors and seniors.

COWL 194 - Group Tutorial (5)

A program of independent study arranged between a group of students and an instructor. Students submit petition to sponsoring agency.

COWL 194F - Group Tutorial (2)

A program of independent study arranged between a group of students and an instructor. Students submit petition to sponsoring agency. Enrollment is restricted to juniors and seniors.

COWL 195 - Senior Thesis (5)

Students submit petition to sponsoring agency.

COWL 198 - Independent Field Study (5)

Provides for college-sponsored individual study programs off campus, for which faculty supervision is not in person (e.g., supervision is by correspondence.) Up to three such courses may be taken for credit in any one quarter. Approval of student's adviser, certification of adequate preparation, and approval by provost required.

COWL 199 - Tutorial (5)

Various topics to be arranged. Students submit petition to sponsoring agency.

COWL 199F - Tutorial (2)

Various topics to be arranged. Students submit petition to sponsoring agency.

CRES - CRITICAL RACE AND ETHNIC STUDIES

Lower-Division

CRES 10 - Critical Race and Ethnic Studies: An Introduction (5)

Examines the concept of race, followed by an investigation of colorblindness, multiculturalism, and post-racialism. Race and ethnicity are examined as historically formulated in relationship to the concepts of gender, sexuality, class, nationalism, indigeneity, citizenship, immigration, and inequality.

Prerequisite: Prerequisite(s): Satisfaction of the Entry Level Writing requirement.

CRES 15 - Resource Centers Service Learning Course (5)

This service learning course offers students of all majors the opportunity to intern at UCSC Resource Centers. Students organize educational community-oriented programs and projects to address retention and equity issues in higher education. Through this course, students develop critical thinking, problem-solving, project planning, and writing skills by combining theoretical concepts and experiential learning experience. Students explore texts that highlight resiliency of minoritized communities through the study of trans, queer, Asian American/Pacific Islander, Black, American Indian, Chicana/Latina, undocumented, and feminist political thought.

CRES 45 - Pilipinx Historical Dialogue (5)

Examines the history, politics, and cultural expressions of the Pilipinx community, in the Philippines and the diaspora, with an emphasis on Pilipinx and Pilipinx-American activism.

CRES 60E - Blackness and Indigeneity in Europe (5)

What are the contours of Black Europe? This course emphasizes a range of disciplinary approaches to the concepts of blackness and indigeneity, introducing and questioning Black Europe as a field, a culture, and a set of ideologies.

CRES 68 - Approaches to Black Studies (5)

Provides a diasporic approach to the field of Black Studies in the modern era, with a focus on histories of dispossession and resistance.

CRES 70S - Introduction to the Sikhs (2)

Introduces the Sikh community, including its origins, history, belief system and contemporary challenges. Other topics include Sikh music, art, literature, and aspects of Sikh society. Specific attention is paid to the Sikh diaspora community in the United States, and in California in particular, including comparative perspectives with respect to other minority communities.

CRES 70U - (Un)docu Studies (5)

Legal papers, as a violent affirmation of settler sovereignty, do not capture the complexities of who we are, much less all our relations--to each other, to place, to life worlds. In this class, by exploring those complexities, we strive to create a communal space where we courageously articulate self, community, and relationality in ways that state documents must disavow.

CRES 94 - Group Tutorial (5)

A lower-division group tutorial, led by a faculty member, that focuses on various problems within critical race and ethnic studies. Topics to be chosen by the instructor and undergraduate student participants. Enrollment is restricted to critical race and ethnic studies majors.

CRES 94F - Group Tutorial (2)

A program of independent study arranged between a group of students and a faculty instructor. Students submit petition to sponsoring agency. Enrollment is restricted to critical race and ethnic studies majors.

CRES 99 - Tutorial (5)

Students submit petition to sponsoring agency.

Upper-Division

CRES 100 - Comparative Theories of Race and Ethnicity (5)

Examines race and ethnicity as categories of lived identity intersecting with gender, sexuality, class, and culture; historical discourses of difference underwriting social inequalities and movements to redress those inequalities; and concepts critical to the understanding and reshaping of power and privilege.

Prerequisite: Prerequisite(s): CRES 10 and satisfaction of the Entry Level and Composition requirements.

CRES 101 - Research Methods and Writing in Critical Race and Ethnic Studies (5)

Examines how scholars and activists produce knowledge in critical race and ethnic studies. Interrogates key terms to build a foundation and literacy in research methods. The course is project-based; and requires work on a team.

Prerequisite: Prerequisite(s): CRES 10 and satisfaction of the Entry Level Writing and Composition requirements.

CRES 111 - The Sounds of Struggle (5)

Explores relations between music and democratic politics. Is harmony the ideal condition of the nation-state? Is disharmony a necessary condition of democracy? Students read literary texts alongside political philosophy and listen to music as we explore how musical recordings and performances produce our understanding of the citizen-nation relationship.

CRES 112 - AsianAm Enviro Justice (5)

Explores the concept of environmental racism in a transnational framework, focusing on the shaping of Asian American and Pacific Islander communities in the United States and in the current and former territories of U.S. empire in the Pacific. Students explore environmental racism within the historical contexts of U.S. militarism and imperial warfare, empire and settler colonialism, disasters and disaster aid, and climate change refugeehood.

CRES 114 - Race and Disability in American Drama (5)

Investigates how African-American, Asian-American, and Latin-American playwrights represent and criticize the concept of race and disability in their dramas on topics from freak shows to Jim Crow laws to the Virginia Tech massacre. Students cannot receive credit for this course and LIT 151K.

CRES 116 - Race and the Pacific: U.S. and Japanese Empires in Comparative Perspective (5)

A lens on the U.S. and Japanese empires that moves beyond the limits of traditional area and ethnic studies by thinking comparatively about the racial logic of empire. Examines how the U.S. and Japanese empires as rival powers that from the early 20th century onward, have competed against and conspired with each other in Asia and the Pacific.

CRES 118 - Abolitionist Futures (5)

Grounded in local, national, and global prison abolition movements, this course explores through feminist political frameworks creative strategies that imagine and work to end all systems of domination and exploitation. Looks at California's prisoner organizing and abolition movements, along with other historic and contemporary social movements which deepen our understandings of the ways in which carceral systems are shaped by and through capitalist formations of race, gender, sexuality, and disability. Also examines strategies such as disability justice and transformative justice which demonstrate expansive and liberatory visions of abolition, extending far beyond the prison system itself.

CRES 131 - Black Freedom Movements (5)

Examines the development of Black freedom movements ranging from resistance to slavery to contemporary movements for Black power in Jackson, Mississippi. Interdisciplinary in scope, course examines a variety of materials ranging from novels, to autobiographies, to political manifestos in order to understand fully the broad scope of Black freedom movements.

CRES 150 - Race, Gender and Algorithms (5)

Algorithms shape race and gender today, yet algorithms are older than digital media and can be understood as recipes or rituals. Course engages with the emerging field of trans of color poetics by studying readings in women of color feminism, transgender studies, and decolonial theory. Digital media art grounds the discussion, including works from queer and trans artists of color working in digital games, anti-surveillance fashion and performance art. Students create digital media projects in response to the ideas of the course, in the medium or platform of their choice, including video prototypes, web sites, Scalar books, Twine games, podcasts and/or video channels, the technical aspects of which will be covered in class.

CRES 181 - The Lynch Doctrine: From Rough Justice to Stand Your Ground (5)

Interdisciplinary course examining the history, politics, and aesthetics of lynching culture in the United States.

CRES 185A - Race, Gender, and Science (5)

Examines how science as epistemology and its accompanying practices participate in, create, and are created by understandings of race, gender, sexuality, and nation.

Prerequisite: Enrollment is restricted to critical race and ethnic studies majors. Other majors by permission.

CRES 188A - Topics in Transnational Asian American and Pacific Islander Studies (5)

Focuses on a particular topic in Asian American and Pacific Islander studies. Topics vary with each offering but might include approaching racial and ethnic formations through a range of disciplinary and interdisciplinary perspectives, with a focus on a transnational critique of intellectual histories, political movements, cultural expressions, lived experiences and critical theories of Asian Americans and Pacific Islanders.

CRES 188B - Topics in Black Studies (5)

Focuses on a particular topic in black studies. Topics vary with each offering but might include approaching racial and ethnic formations through a range of disciplinary and interdisciplinary perspectives, with a focus on the intellectual histories, political movements, cultural expressions, lived experiences, and critical theories of peoples throughout the Black diaspora and Africa.

CRES 188X - Topics in Critical Race and Ethnic Studies (5)

Focuses on a particular topic in critical race and ethnic studies. Topics vary with each offering but might include approaching racial and ethnic formations through a range of disciplinary and interdisciplinary perspectives, including indigenous studies, Black studies, Latinx studies, Asian American studies, queer critique, gender studies, transgender studies, performance studies, human rights studies, mixed race studies, legal studies, critical area studies, war and empire studies, environmental studies, science studies, and critical university studies.

CRES 190A - Critical Race Feminisms (5)

Focuses on key learning outcomes of humanistic research and writing: developing a method for critical race feminist analysis, identifying objects and fields of study, formulating an appropriately narrow topic and thesis, identifying and critiquing sources, and completing well-structured written argumentation. Readings offer key theoretical models in critical race and ethnic studies, feminist studies, and queer theory.

Prerequisite: Prerequisite(s): CRES 10 and CRES 100; and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to critical race and ethnic studies majors.

CRES 190B - Critical Migration Studies (5)

Focuses on critically analyzing public representations of migration. Exploring key scholarship in migration and diaspora studies, including recent writings on "border crises," students develop an individual research project exploring a controversy, archive, cultural text, or historical debate in research on a specific migrant or diasporic group. The focus is on key learning outcomes of humanistic research and writing: developing a method for studying migration attentive to critical race analysis; identifying objects and fields of study, formulating research questions, organizing an appropriately narrow thesis, identifying and critiquing sources, and completing well-structured written argumentation.

Prerequisite: Prerequisite(s): CRES 10 and CRES 100; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior critical race and ethnic studies majors.

CRES 190D - Black Geographies and the Imperative of Abolition (5)

Far from a recent development, abolitionist demands to defund the police are actually central to a 400-year legacy of Black struggle. In the wake of the 2020 Black Lives Matter uprisings that erupted in response to several high-profile police murders, this senior seminar takes an interdisciplinary look at the burgeoning field of Black geographies to help us understand the

renewed urgency of these calls in our current moment by engaging with works of activism, speculative fiction, and multimedia, including videos, podcasts, music, websites, and graphics.

Prerequisite: Prerequisite(s): CRES 10 and CRES 100; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior critical race and ethnic studies majors.

CRES 190P - Trans of Color Movements in Media, Art and Performance (5)

Trans of color poetics are emerging in media art and performance, the voice of movements for liberation from colonial systems of racialized gender, and the structures which uphold them, including the prison-industrial complex. Trans people of color, and people who exist in resistance to colonial gender constructs are responding to the ways that both popular media and academic fields such as transgender studies have focused on white, wealthy, normative transgender subjects. Seminar considers the social movements and the embodied movement of trans people of color and gender non-conforming people in media, art and performance.

Prerequisite: Prerequisite(s): CRES 10 and CRES 100; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior critical race and ethnic studies majors.

CRES 190S - From Slavery to Precarity: Race, Logistics and Globalization (5)

Over the past half-century, there has been a profound transformation in the way that goods are produced and moved about the world resulting in what has been referred to as the "logistics revolution". Course examines the ways in which this "revolution" in mass circulation of goods necessitates a radical thinking of race and racial politics in the context of contemporary capitalist globalization.

Prerequisite: Prerequisite(s): CRES 10 and CRES 100; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior critical race and ethnic studies majors.

CRES 190T - The War on Terror: Imperialism Past and Present (5)

Senior seminar focusing on the theoretical underpinnings of U.S. imperialism from a global perspective, from the annexation of the Philippines in 1898 to the current War on Terror. Drawing on the history of U.S. settler-colonialism and liberal empire as racial projects, the course investigates contemporary forms of racialization surrounding the Muslim as figure for foreign enemy. Utilizing a diverse range of media, course considers various theoretical texts in critical race and ethnic studies, visual studies, gender and queer studies, history, and literature.

Prerequisite: Prerequisite(s): CRES 10 and CRES 100 and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior critical race and ethnic studies majors. .

CRES 192 - Directed Student Teaching (5)

Teaching of a lower-division seminar by an upper-division student under faculty supervision. (See CRES 42.)

CRES 194 - Group Tutorial (5)

Group tutorial, led by a faculty member, that focuses on various problems within critical race and ethnic studies. Topics to be chosen by the instructor and undergraduate student participants. Enrollment restricted to critical race and ethnic studies majors.

CRES 199 - Tutorial (5)

Students submit a petition to the sponsoring agency.

CRES 199F - Tutorial (2)

Individual study in areas approved by sponsoring instructors. May not be counted toward upper-division major requirements. Student submits petition to sponsoring agency. Enrollment is restricted to critical race and ethnic studies majors.

Graduate**CRES 200 - Black Studies Methods (5)**

Exploration of interdisciplinary research methodology—a broader set of scientific beliefs, approaches, inquiries, theories, and analytics—relevant to the study of Black communities. Students read, explore, and engage in particular methods—approaches to data collection and analyses—emphasizing various forms of ethnographic research. Course also examines other approaches to the study of Blackness, such as historical/archival, cultural studies and discursive analyses, and mixed methods.

Prerequisite: Enrollment is restricted to graduate students.

CRES 297A - Independent Study (5)

Independent study and research under faculty supervision. Students submit petition to sponsoring agency. Enrollment is restricted to graduate students.

CRSN - CARSON COLLEGE**Lower-Division****CRSN 1 - Academic Literacy and Ethos: Environment and Society (5)**

Teaches foundational concepts for intellectual exploration and personal development within an academic community: analysis, critical thinking, metacognition, engagement with others across difference, and self-efficacy. Engages students in Rachel Carson's intellectual tradition of investigating relationships between environment and society.

Prerequisite: Enrollment is restricted to first-year college members.

CRSN 1A - Introduction to University Life and Learning (1)

Orientation to and exploration of the nature of the liberal arts, and of learning at research universities. Topics include:

academic planning for upper-division coursework; enrollment processes; and understanding pathways to degree completion; UCSC resources that support health and well-being strategies for academic success; the cultivation of just communities; the prevention of sexual harassment and violence; campus conduct policies; awareness of risks associated with drug and/or alcohol use; and an introduction to traditions of community-engaged learning, ground-breaking research, and interdisciplinary thinking that define a UC Santa Cruz degree. This course can be taken for Pass/No Pass grading only.

Prerequisite: Enrollment is restricted to entering first-year Rachel Carson College students.

CRSN 10 - Academic Success (2)

An interactive course providing students with the opportunity to assess and revise methods of and purposes in studying. Critical, effective approaches to reading, writing, participating in lectures and sections, taking exams, balancing competing responsibilities, and utilizing campus resources are all explored. Enrollment by permission of college adviser.

CRSN 15 - Strategies to Jump Start Your STEM Learning (2)

Introduces tips and techniques to supplement and expand a student's existing repertoire of science/mathematics problem-solving skills for science, technology, engineering, and mathematics (STEM) classes. The material covered is intended to aid development as a confident learner and future expert in the student's major.

Prerequisite: Enrollment is restricted to first-year through third-year students. Others may enroll with instructor permission.

CRSN 15A - STEM Essentials (2)

Introduces tips and techniques to supplement and expand a student's existing repertoire of science/mathematics problem-solving skills for science, technology, engineering, and mathematics (STEM) classes. The material covered is intended to aid development as a confident learner and future expert in the student's major.

CRSN 20C - The Water Environment: Literature of the Sea (2)

Students consider the representation of the sea in selected texts, noting how it becomes the focal point for the fears, hopes, and prejudices of Western civilization. Students write critical papers and their own narratives.

Prerequisite: Enrollment restricted to first-year and sophomore college members.

CRSN 20D - College Students' Lives (2)

Students understand their peers and themselves better through an exploration of issues that affect the daily life of college students. Topics include campus/student cultures, the academic system, and other critical issues. Overview of campus resources also provided.

Prerequisite: Enrollment restricted to first-year and sophomore College members.

CRSN 20F - Justice on Earth (3)

Examines issues of oppression, privilege, and social justice within a global and environmental context through self-reflective and group work. May include an optional service-learning component requiring travel during spring break.

CRSN 20G - Peregrine Falcons Return (2)

A case study of the 1970s-1990s UC Santa Cruz effort to restore a nearly extinct peregrine falcon population including reviews of the Endangered Species Act, falcon physiology, and the innovative conservation biology techniques that led to success.

CRSN 28 - Peer Leadership in Higher Education (3)

Overview of theories of student development, critical student issues, and skills needed for appropriate peer leadership interventions. Utilizes a variety of learning modes including readings, discussions, case studies, lectures, and group projects. Interview only: approval of instructor; Resident Assistant (RA) pre-employment training course.

CRSN 55 - Rachel Carson College: Service Learning Practicum (2)

Introduces service-learning theory and practice for students engaging in service-learning work in the college, college-related projects, community service organizations, or public agencies.

Prerequisite: Enrollment restricted to college members until after priority enrollment.

CRSN 56 - Media Internships for Sustainability (2)

Students develop and work on media projects related to the college theme of Environment and Society in film, on television, in print, and on the Internet. Students work in groups with specific instructors and project leaders. Enrollment by application and instructor consent.

CRSN 61 - Education for Sustainable Living Program (2)

Analyzes sustainability and its application in daily life and on campus, involving collaboration between students, faculty, staff, administration, and the community. Guest lecturers, discussions, an optional UC-wide retreat, and essays allow engagement with aspects of ecological and social sustainability.

CRSN 81C - Designing a Sustainable Future (5)

Introduces key technological solutions to environmental problems; discusses their underlying principles; and examines their societal dimensions. Topics include: conventional and renewable energy; emerging technologies for transportation, energy efficiency clean water; planetary engineering; and lean manufacturing.

Prerequisite: Prerequisite(s): CRSN 80A or CRSN 80B. Enrollment restricted to first-year and sophomore college members.

CRSN 82 - Environment and Society in Film (2)

Students write about and discuss a variety of films and articles about environment and society. Topics may include water, food systems, wilderness, wildlife, pollution, global warming, nuclear energy, conservation, and environmental activism.

Prerequisite: Enrollment restricted to college members.

CRSN 90 - Cultivating Food Justice and Sustainability (1)

Learn sustainable, ecologically sound horticulture, permaculture, and small-scale organic agricultural practices through hands-on gardening experience. This outdoor interdisciplinary course operates within a food justice framework. (Formerly Rachel Carson College Garden Internship.)

Prerequisite: Enrollment restricted to college members. Other students by permission of the instructor.

CRSN 93 - Field Study (5)**CRSN 99 - Tutorial (5)****CRSN 99F - Tutorial (2)**

Individual study for lower-division students directed by a faculty member affiliated with the college. Students submit petition to sponsoring agency.

Upper-Division**CRSN 128 - Advanced Peer Leadership Practicum (3)**

Advanced practicum for the application of skills and theoretical knowledge studied in course 28. Uses many learning modes including readings, discussions, case studies, lectures, and group projects. Prerequisite(s): CRSN 28. Enrollment by permission of instructor.

CRSN 151A - Sustainability Praxis in the Natural and Built Environment (5)

Introduces the concepts, methods, practices, and tools of the trade for conceptualizing and conducting research in sustainability praxis in the built environment, and the quantitative and analytical tools required to conduct such analysis and research. (Formerly Sustainability Praxis in the Built Environment).

CRSN 151B - Innovation and Professionalization for Sustainability Designers, Engineers, and Entrepreneurs (5)

Teaches how to become innovators and entrepreneurs, develop projects and enterprises, and adopt professional practices. Focuses on sustainability for students in Sustainability Studies, especially in connection with students' research and interests.

CRSN 151C - Sustainability Laboratory Tools, Techniques, and Applications (3)

Introduces the concepts, skills, and strategies fundamental to the successful development of sustainability-related projects appropriate to the Sustainability Lab. Provides access to

functional and living laboratory space, equipment, professional development, and technical training.

CRSN 152 - IDEASS Laboratory Practicum (2)

Laboratory designed to advance sustainability education with real-world impact. Enables students to develop as change agents and to make valued contributions to sustainable-design projects that advance new technologies or strategies and bring about societal and environmental change.

CRSN 155 - Rachel Carson College Sustainability Internship (2)

For students undertaking sustainability-oriented service-learning work in the college (college-related projects, community service organizations, or public agencies). Students are supervised by the instructor and project supervisor, and determine the content of their internship with the instructor and supervisor.

Prerequisite: Enrollment restricted to college members or by permission of instructor.

CRSN 155S - Innovation & Sustainability for Global Impact Practicum (3)

Centered around an internship, students learn how to use design thinking and lean innovation tools to research global sustainability problems, design innovative solutions, prototype and test them, and launch them in the real world. These tools will help students initiate and develop sustainability innovation projects in companies, non-profit organizations, startups, government, and more, with the intention to make a positive impact on people and the environment. This course fulfills a requirement for the sustainability minor, and is also open to any students from other minors and majors.

CRSN 160 - Developing Leadership to Facilitate Environmental Education (5)

Prepares students to facilitate working groups for Sustainable Living (courses 61/161) during the spring quarter. The skills acquired during this course include: facilitation skills; problem-solving; syllabus planning; curriculum building; experiential learning techniques; leadership skills; cultural competence; and non-violent communication training. Enrollment by interview only. Enrollment restricted to sophomores, juniors, and seniors.

CRSN 161 - Education for Sustainable Living Program (5)

Analyzes sustainability and its application in daily life and on campus, involving collaboration between students, faculty, staff, administration, and the community. Guest lecturers, discussions, an optional UC-wide retreat, and essays allow engagement with aspects of ecological and social sustainability.

CRSN 162 - Sustainability Internship Practicum (5)

Introduces students to sustainable practices and state, local, and UC-wide policies through projects. Matches students with UCSC staff partners to work collaboratively on projects that integrate sustainability into aspects of campus operations. Supports students to develop the competencies necessary to become effective environmental professionals through learning models including hands-on work experience; professional skills

training; guest lectures; reading, and discussion; and peer-to-peer advising. In addition to project deliverables, students complete and present a portfolio of their work upon completion of their project. Enrollment limited to Sustainability Office Interns and by instructor permission; an interview, resume, and cover letter are required.

CRSN 193 - Field Study (5)

CRSN 193F - Field Study (2)

Provides for individual programs of study sponsored by the college and performed off campus. Must be sponsored by college faculty. Approval of the student's adviser and the academic preceptor is needed to enroll. May be repeated three times for credit. Students submit petition to sponsoring agency.

CRSN 195 - Senior Thesis (5)

CRSN 198 - Independent Field Study (5)

CRSN 199 - Tutorial (5)

CRSN 199F - Tutorial (2)

Individual study for upper-division students directed by a faculty member affiliated with the college. Students submit petition to sponsoring agency.

CRWN - CROWN COLLEGE

Lower-Division

CRWN 1 - Academic Literacy and Ethos: Ethical and Societal Implications of Emerging Technologies (5)

Teaches foundational concepts for intellectual exploration and personal development within an academic community: analysis, critical thinking, metacognition, engagement with others across difference, and self-efficacy. Examines how technological revolutions happen, how they transform societies, and how these changes generate new ideological narratives.

Prerequisite: Enrollment is restricted to first-year college members.

CRWN 1A - Introduction to University Life and Learning (1)

CRWN 1A explores opportunities, expectations, and responsibilities in university life. Topics include: academic planning; general education requirements; majors and minors; campus policy; and preparation for CRWN 1A: Power & Representation. Students gain familiarity with resources for health, well-being, time management, academic success, cultivating just communities, sexual harassment and violence prevention, reflection on UCSC's principles of community, and an introduction to the living and learning tradition of Crown College. This course can be taken for Pass/No Pass grading only.

Prerequisite: Enrollment is restricted to entering first-year Crown College students.

CRWN 28 - Crown Student Leadership Development Seminar

(2)

Explore leadership as it relates to student development at Crown College. Examine how values, ethics, involvement, identity, and theory affect leadership in a variety of content areas. Evaluate student's leadership strengths to determine objectives for improvement.

CRWN 31 - Crown College Student Leadership in Action Seminar (2)

Focuses on developing and establishing leadership skills and styles for new leaders at Crown College. Explores communication styles, group dynamics, community development, programming, moral development and conflict resolution concepts and strategies. Applies theory to action. Enrollment limited to college members and by permission of instructor.

CRWN 60 - The Environment on Film: Rhetoric of Ecocriticism (5)

Examines the overt as well as the subtle cinematic elements that depict, ponder, and persuade concerning issues of the environment and the role of humans regarding nature, animals, and the human-made landscape.

Prerequisite: Enrollment is restricted to college members.

CRWN 70 - Introduction to Broadcast Media: Radio (3)

S. Stoklos

Comprehensive history of noncommercial radio as a mass-communication medium. Course also serves as an introduction to UCSC's radio station KZSC-FM and broadcasting. Through lectures, hands-on instruction, and written assignments, students learn the fundamentals of program presentation and audio production. Prerequisite(s): After completing 20 hours of orientation volunteering at KZSC, students apply to the instructor. Enrollment is by permission of the instructor. Concurrent enrollment in CRWN 70L is required.

CRWN 70L - Broadcast Production: Radio (2)

Practical application of technical and creative skills in the KZSC studios. Production of audio content and promotional materials for broadcast. Critical evaluation in a workshop setting. Assignments require original research, professional writing, and the operation of complex technology.

Prerequisite(s): After completing 20 hours of orientation volunteering at KZSC, students apply to the instructor. Enrollment is by permission of the instructor. Concurrent enrollment in CRWN 70 is required.

CRWN 79 - Introduction to Social and Ethical Implications of Emerging Technologies (2)

An introduction to the theme of Crown College, "Social and Ethical Implications of Emerging Technologies". Taught in a small class format and articulated around a group project, both of which help generate sense of belonging, and is the key to the success of our transfer students. The group project will be used to introduce academic research and also strategies for effective

work in groups, which is an essential skill in most fields, and of particular relevance to STEM disciplines.

CRWN 80F - Science Fictions (5)

D. Farquhar

Examines how science fictions have imagined better and worse worlds, social relations, and identities by using science and technology. Students read novels and short stories from the 19th Century to the present and discuss and debate questions of justice, freedom, difference, and identity.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing requirement.

CRWN 80J - Cyborg Society: Myths, Realities, Choices (5)

Examines content and methodologies of the emerging field of cyborgology. Includes social studies of science, anthropology, sociology, philosophy, politics, art, biology, and informatics.

CRWN 80L - Food Safety and Environmental Quality: The Complexities of a Safe Salad (5)

In recent years, outbreaks of food-borne illness have alarmed farmers and consumers alike. This course examines the complexities of ensuring food safety in the complex natural, economic, and social settings that characterize U.S. food-production systems.

CRWN 80S - Undergraduate Seminar in Science, Technology, and Society (5)

An honors seminar for first year students on selected topics that examine the relationship between science, technology, and society. Precise focus of each seminar varies and is announced by the college.

Prerequisite: Preference given to Crown College students. Enrollment is restricted to first-year and sophomore students.

CRWN 85 - Visual Perception: A Window to Brain and Behavior (5)

Investigates visual perception as an example of the correlation of brain and behavior. Uses a multidisciplinary analysis of the optical, biochemical, and neural components of the visual pathway leading to the perception of form, color, etc. Discusses the applications of neuroscience in the social sciences, the humanities, engineering, and the arts.

Prerequisite: Enrollment is restricted to students in the Crown College or Cowell College first-year honors program.

CRWN 86 - Professional Communication in a Digital Age (5)

Provides advanced training in communication strategies. Students learn to combine narrative theory with digital technologies to achieve effective communication in a variety of contexts including social media, instructional information, and product design. These elements will be integrated into an individual and a group project.

Prerequisite: Enrollment is restricted to College Scholars Students.

CRWN 87 - Understanding and Communicating the Science Behind Global Warming (5)

Provides tools to critically assess the current debate on the implications of global warming and to communicate the issues to the public effectively. Examines how questions are framed and addressed by scientists in general and how they are framed and addressed given our current understanding of the problem of global warming based on basic physics and statistical analyses of climate data. Includes practical assignments and guest lectures by local UCSC experts.

Prerequisite: Prerequisite(s): Enrollment in the College Scholars Program.

CRWN 88 - Computational Futurology: Use of Data Analysis for Predicting Human Behavior and Activity (5)

P. Rothman

Investigates statistical and computational methods for the prediction of human activity, both at the individual and at the collective level. Students learn to evaluate and critique famous predictions, and consider the ethical and social implications of predictive technologies. Articulated around a creative group project to integrate concepts learned in the course.

Prerequisite: Enrollment is restricted to College Scholar Students.

CRWN 89 - Workshop in Computational Biology (5)

Designed to engage students with training in areas related to computational biology. Covers basic biological, statistical, and computational concepts needed for hands-on research; training students to read primary literature and do collaborative work in an interdisciplinary setting. Enrollment restricted to students with some background in programming, math or biology and by permission of instructor.

CRWN 90 - Start-up Entrepreneurship Academy (5)

Introduction to the basics of setting up a start-up company using the Lean Launchpad/NSF I-Corps model of instruction. Students learn principles of data collection, marketing processes, and resources needed for new companies. The class is articulated around the design of a business plan, in groups of 4-5 students coached by a successful entrepreneur, and culminates in a presentation. The market research for the project involves talking to at least 5 potential customers, partners, channels and/or related experts each week.

Prerequisite: Enrollment is restricted to College Scholar Students.

CRWN 92 - Social and Creative Entrepreneurship (5)

Helps students discover and develop their own business idea that does the world good. Examines leadership and provides tools to research community issues and to develop sustainable business models. Guest lecturers and project mentors introduce students to business and civil leaders.

CRWN 93 - Field Study (5)

Provides for individual programs of study sponsored by the college and performed off campus. Students should review plans with an appropriate fellow of the college. A proposal should be presented to the college academic preceptor no later than the seventh week of the preceding quarter. Credit is granted by the sponsor upon approval of the work performed. Students submit petition to sponsoring agency.

CRWN 93F - Field Study (2)

Provides for individual field study in the vicinity of the campus under the direct supervision of a faculty sponsor. Students submit petition to sponsoring agency.

CRWN 95 - GetVirtual Business Assistance (5)

Community service-oriented class that provides supervised learning experiences where students reflect on, communicate, and integrate principles and theories from the classroom in real-world settings. Service learning provides students with an opportunity to integrate their academic coursework with community involvement. Students are paired with industry experts as mentors and gain valuable practical skills such as interview practices and delivering real solutions to local businesses suffering from the new world COVID-19 paradigm. Prerequisite(s): CRWN 90 or CRWN 92. Enrollment is by permission of the instructor.

CRWN 96 - Digital Theater Workshop: Theorizing Culture and the Future (5)

Teaches different interpretation tools to be applied to a selection of dramatic literature in discussions. Students integrate these skills and develop their creativity through mounting a production of the play R.U.R., which addresses the impact of technology in society.

CRWN 97A - Foundations of Applied Ethics and Values of Emerging Technologies (2)

Provides the foundational skills for actively participating in ethical discussions on the impact of emerging technologies and opportunities. Also designed to help develop the necessary skills for hands-on skills in teamwork, problem-solving, and communication. The course will consist of readings, lectures and presentations, participation in the discussion forum, a set of written assignments, and a group project. CRWN97A coordinates with CRWN97B, an internship at CAEVET, Crown Center for Applied Ethics and Values of Emerging Technologies.

CRWN 97B - Center for Applied Ethics and Values of Emerging Technologies (CAEVET) Internship (2)

Focuses on developing students' leadership skills that builds on Crown 97A, an introductory class to applied ethics. Interns choose from a list of showcase themes and developing activities to deepen their understanding of the selected topic and reflect on how they can help enact change. These include current events discussions, the generation of content for the center's website, interviewing leaders/influencers, and proposing an action-oriented activity or program to further the mission of the center. Crown 97 provides an intellectual community to support

and provide feedback for each intern. Prerequisite(s): CRWN 97A. Enrollment is by interview and permission of the instructor.

CRWN 98 - Podcasting: Digital Storytelling (2)

Course walks students through the process of creating a podcast from concept to broadcast. Students' podcasts can be based on any research project or subject that they want. Class provides students with working knowledge of current trends in audio production and includes lessons on sound gathering using professional sound gear as well as cell phones, interviewing, script writing, audio editing and developing a "radio voice." Students watch each other's progress, learning to collaborate, problem-solve and take risks together. Finally, the class also examines the media and trains students to think critically about stories they consume.

Prerequisite: Prerequisite(s): CRWN 1 or by permission of the instructor.

CRWN 99F - Tutorial (2)

Various topics to be arranged between student and instructor. Students submit petition to sponsoring agency.

Upper-Division

CRWN 123 - Examining Our Life Through Writing (5)

Writing-intensive seminar. Based on course readings and discussions, students write reflective response papers at the end of each class and weekly papers on their own lives and what they care most about. Intense class discussions, often started by students sharing their essays. Prerequisite(s): satisfaction of the Composition 1 requirement. Admission by permission of instructor after student reads lengthy syllabus, writes application, and interviews with instructor during faculty office hours.

CRWN 185 - Career and Internship Preparation (2)

For students preparing for an internship experience or career position. Students undertake career development as a continuous lifelong process: learn techniques for an effective job search, such as preparing a resume and cover letter, interviewing and networking skills; and learn how to more clearly articulate their future educational and professional goals.

CRWN 192 - Directed Student Teaching (5)

Teaching of a lower-division seminar by an upper-division student under faculty supervision. (See CRWN 42.)

CRWN 198 - Independent Field Study (5)

Provides for college-sponsored individual study programs off campus. Approval of student's faculty sponsor and college academic provost required.

CRWN 199 - Tutorial (5)

Various topics to be arranged between student and instructor. Students submit petition to sponsoring agency.

CRWN 199F - Tutorial (2)

Various topics to be arranged between student and instructor. Students submit petition to sponsoring agency.

CSE - COMPUTER SCIENCE AND ENGINEERING

Lower-Division

CSE 3 - Personal Computer Concepts: Software and Hardware (5)

Provides an introduction to computers. Personal computing is emphasized, and students are introduced to word processing, spreadsheets, database management, graphics, and programming. Covers fundamentals of computing and current and future uses of computer technology, PC hardware, Windows operating system, applications software, networking and the Internet, and developments in the computer industry. Designed for students with little or no experience using computers. Students cannot receive credit for this course and Computer Science 2. (Formerly Computer Engineering 3.)

CSE 5J - Introduction to Programming in Java (5)

Introduces programming in Java for students who have no prior programming experience. Students learn programming and documentation skills, as well as algorithmic problem-solving, and programming methodologies. Introduces computers, compilers, and editors. Students write small to medium-sized programs. This course and CSE 5C and CSE 5P cover similar concepts, but use different programming languages. Because CSE 5J followed by CSE 11 is a two-quarter alternative to the accelerated course CSE 12A and CSE 12L, engineering majors and students planning on continuing the programming sequence are encouraged to take CSE 5J rather than CSE 5C or CSE 5P. Students may not receive credit for CSE 5J taken concurrently or subsequently to CSE 12A, CSE 12B, or Computer Engineering 13. (Formerly CMPS 5J.)

CSE 10 - Introduction to Computer Science (5)

An overview of the theory, foundations, and practice of computer science with emphasis on what computers can and cannot do, now and in the future. Topics include algorithms and data, correctness and efficiency of algorithms, hardware, programming languages, limitations of computation, applications, and social issues. No programming skills are required as a prerequisite. Major concepts and open problems in computer science are presented without reliance on sophisticated mathematical tools. Students cannot receive credit for this course after completing CSE 15. (Formerly CMPS 10.)

CSE 12 - Computer Systems and Assembly Language and Lab (7)

Introduction to computer systems and assembly language and how computers compute in hardware and software. Topics include digital logic, number systems, data structures, compiling/assembly process, basics of the system software, and computer architecture. Course is 7 credits with integrated laboratories illustrating concepts covered in lecture. Note that

CSE 12 assumes some programming experience. Students can show programming experience by taking one of the courses listed in the prerequisite list below or by taking the CSE python Test-out Exam: <https://undergrad.soe.ucsc.edu/cse-20-testout-exam> (Formerly CSE 12 and CSE 12L)

Prerequisite: Prerequisite(s): CSE 5J, or CSE 20, or CSE 30, or BME 160, or equivalent.

CSE 13S - Computer Systems and C Programming (7)

Focuses on C programming, command line, shell programming, editors, debuggers, source code control, and other tools. Examines basic computer systems, algorithm design, and development, data types, and program structures. Develops understanding of process model, compile-link-execute build cycle, language-machine interface, memory, and data representation. Students cannot receive credit for both CSE 13S and CSE 13E. Course is 7 credits with integrated laboratory.

Prerequisite: Prerequisite(s): CSE 12 or BME 160.

CSE 16 - Applied Discrete Mathematics (5)

Introduction to applications of discrete mathematical systems. Topics include sets, functions, relations, graphs, predicate calculus, mathematical proof methods (induction, contraposition, contradiction), counting methods (permutations, combinations), and recurrences. Examples are drawn from computer science and computer engineering. Knowledge of computer programming is useful before taking this course. Students who do not have prior programming experience are strongly recommended to take Computer Science 5C, 5J, or 5P before taking this course.

Prerequisite: Prerequisite(s): MATH 19A or MATH 19B or MATH 11B or AM 11B or AM 15B or ECON 11B.

CSE 20 - Beginning Programming in Python (5)

Provides students with Python programming skills and the ability to design programs and read Python code. Topics include data types, control flow, methods and advanced functions, built-in data structures, and introduction to OOP. No prior programming experience is required. Students may not receive credit for CSE 20 after receiving credit for CSE 30. Students with prior programming experience (especially in Python) are encouraged to take CSE Testout Exam to be evaluated for their readiness to take CSE 30 directly: <https://undergrad.soe.ucsc.edu/cse-20-testout-exam>.

CSE 30 - Programming Abstractions: Python (7)

Introduction to software development in Python focusing on structuring software in terms of objects endowed with primitive operations. Introduces concepts and techniques via a sequence of concrete case studies. Coursework consists of programming assignments and a final examination. Note that CSE 30 assumes some Python experience, students trained in a different language should self-study Python to prepare for CSE 30. See CSE Testout Exam for resources and further information.

Prerequisite: Prerequisite(s): CSE 20 or BME 160; and MATH 3 or MATH 11A or MATH 19A or AM 3 or AM 11A or ECON

11A, or a score of 400 or higher on the mathematics placement examination (MPE).

CSE 40 - Machine Learning Basics: Data Analysis and Empirical Methods (5)

Introduction to the basic mathematical concepts and programming abstractions required for modern machine learning, data science, and empirical science. The mathematical foundations include basic probability, linear algebra, and optimization. The programming abstractions include data manipulation and visualization. The principles of empirical analysis, evaluation, critique and reproducibility are emphasized. Mathematical and programming abstractions are grounded in empirical studies including data-driven evidential reasoning, predictive modeling, and causal analysis.

Prerequisite: Prerequisite(s): MATH 19B or MATH 20B, and CSE 30.

CSE 80A - Universal Access: Disability, Technology, and Society (5)

Overview of human-centered technology and of its potential for increasing the quality of life and independence of disabled individuals. A substantial portion of the course is devoted to studying physical, psychological, and psychosocial aspects of disability. Topics include: diversity and integration, legislation, accessibility, and universal design. (Formerly Computer Engineering 80A.)

CSE 80L - Social Data Analytics and Visualization (5)

Course examines: social data analytics--veracity, consistency, uncertainty, volume; statistical computation--misuse, bias, dispersion, correlation, regressions, differential scales, normal distributions, factor and cluster analysis, extrapolation, inference, simple programming; visual representations--communication, critique and design of infographics; applications--environment, energy, economics, education, empowerment. (Formerly Computer Science 80L.)

CSE 80N - Introduction to Networking and the Internet (5)

Introduction to the evolution, technological basis, and services of the Internet, with descriptions of its underlying communications structure, routing algorithms, peer-to-peer hierarchy, reliability, and packet switching. Network security, mail, multimedia and data compression issues, HTML, and digital images. Students who have completed CSE 150 cannot receive credit for this course. (Formerly Computer Engineering 80N.)

CSE 80S - Social Networks (5)

Introduction to social networks and game theory. Topics include the structure of social networks; the world wide web; the flow of information and behavior through networks; and the principles behind modern web search and search-ad placement. (Formerly Computer Science 17.)

Prerequisite: Prerequisite(s): MATH 3 or MATH 11A; or AM 3 or AM 6 or AM 11A or AM 15A; or ECON 11A; or score on math placement exam of 300 or higher.

CSE 94 - Group Tutorial (5)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Students submit petition to sponsoring agency.

CSE 94F - Group Tutorial (2)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Students submit petition to sponsoring agency.

CSE 99 - Tutorial (5)

Students submit petition to sponsoring agency.

CSE 99F - Tutorial (2)

Students submit petition to sponsoring agency.

Upper-Division**CSE 100 - Logic Design (5)**

Boolean algebra, logic minimization, finite-state machine design, sequential circuits, common logic elements, programmable logic devices, and an introduction to system level design. The electrical behavior of circuits including three state outputs, propagation delay, logic levels, and fanout.

Prerequisite: Prerequisite(s): CSE 12; previous or concurrent enrollment in CSE 100L is required.

CSE 100L - Logic Design Laboratory (2)

Laboratory sequence illustrating topics covered in course 100. Two 2-hour laboratory sessions per week. Weekly laboratory assignments which require the use of the oscilloscopes, TTL circuits, computer-aided design and simulation tools, and programmable logic.

Prerequisite: Prerequisite(s): CSE 12; previous or concurrent enrollment in CSE 100 is required.

CSE 101 - Introduction to Data Structures and Algorithms (5)

Introduction to abstract data types and basics of algorithms. Linked lists, stacks, queues, hash tables, trees, heaps, and graphs will be covered. Students will also be taught how to derive big-Oh analysis of simple algorithms. All assignments will be in C/C++. (Formerly Computer Science 101 Algorithms and Abstract Data Types.)

Prerequisite: Prerequisite(s): CSE 12 or BME 160; CSE 13E or ECE 13 or CSE 13S; and CSE 16; and CSE 30; and MATH 11B or MATH 19B or MATH 20B or AM 11B.

CSE 102 - Introduction to Analysis of Algorithms (5)

Methods for the systematic construction and mathematical analysis of algorithms. Order notation, the RAM model of computation, lower bounds, and recurrence relations are covered. The algorithm design techniques include divide-and-conquer, branch and bound, and dynamic programming. Applications to combinatorial, graph, string, and geometric algorithms. (Formerly Computer Science 102.)

Prerequisite: Prerequisite(s): CSE 101.

CSE 103 - Computational Models (5)

Various representations for regular languages, context-free grammars, normal forms, simple parsing, pumping lemmas, Turing machines, the Church-Turing thesis, intractable problems, the P-NP question. (Formerly CMPS 130.)

Prerequisite: Prerequisite(s): CSE 101.

CSE 104 - Computability and Computational Complexity (5)

Turing machines, general phase-structure grammars, the Chomsky hierarchy, recursive functions, diagonalization, the Halting problem, computability and unsolvability, computational complexity, time and space bounds, NP-completeness with emphasis on reductions between problems from various areas. (Formerly CMPS 132.)

Prerequisite: Prerequisite(s): CSE 103.

CSE 106 - Applied Graph Theory and Algorithms (5)

Basic concepts and algorithms are reviewed including trees, Eulerian and Hamiltonian graphs, and graph transversal. Algorithms are explored to solve problems in connectivity, routing, matching, and embedding of graphs. Graph theory and algorithms are developed around applications in computer engineering. (Formerly Computer Engineering 177.)

Prerequisite: Prerequisite(s): CSE 101.

CSE 107 - Probability and Statistics for Engineers (5)

Introduction to fundamental tools of stochastic analysis. Probability, conditional probability; Bayes Theorem; random variables and transforms; independence; Bernoulli trials. Statistics, inference from limited data; outcomes of repeated experiments; applications to design; assessment of relative frequency and probability; law of large numbers; precision of measurements. Elements of stochastic processes, Poisson processes; Markov chains. Students cannot receive credit for this course and Applied Mathematics and Statistics 131. (Formerly Computer Engineering 107.)

Prerequisite: Prerequisite(s): CSE 16; and AM 30 or MATH 22 or MATH 23A.

CSE 108 - Algorithmic Foundations of Cryptography (5)

Focuses on some of the foundational aspects of modern cryptography, namely, private and public key cryptography, digital signatures, pseudorandom generators and functions, message authentication codes, hash functions, and random oracles. Course also connects the formal concepts with some real-world applications, like RA, SSL, and bitcoin, exposing students to general concepts of probability theory, number theory, and rigorous proofs. (Formerly Computer Science 118.)

Prerequisite: Prerequisite(s): CSE 101. Enrollment restricted to computer engineering and computer science majors.

CSE 110A - Fundamentals of Compiler Design I (5)

An introduction to the basic techniques used in compiler design. Topics include compiler structure, symbol tables, regular expressions and languages, finite automata, lexical analysis, context-free languages, LL(1), recursive descent, LALR(1), and LR(1) parsing; and attribute grammars as a model of syntax-directed translation. Students use compiler building tools to construct a working compiler. (Formerly Computer Science 104A.)

Prerequisite: Prerequisite(s): CSE 12 and CSE 101.

CSE 110B - Fundamentals of Compiler Design II (5)

Advanced study of compiler implementation. Topics include compiler structure back end, run-time environments, storage management, garbage collection, register allocation, code generation, basic blocks, control flow, data flow, local and global optimization, interpretation, and machine-code generation. Students may not receive credit for this course and CSE 211. Taught in conjunction with CSE 211. (Formerly Computer Science 104B.)

Prerequisite: Prerequisite(s): CSE 110A.

CSE 111 - Advanced Programming (5)

An introduction to object-oriented techniques of software development including data abstraction, inheritance, polymorphism, and object-oriented design. Extensive practice using a computer to solve problems, including construction of graphical user interfaces and a multithreaded client/server applications.

Prerequisite: Prerequisite(s): CSE 15 and CSE 15L; or CSE 13S and CMPM 35; or CSE 13E and CMPM 35; or ECE 13 and CMPM 35; or CSE 101.

CSE 112 - Comparative Programming Languages (5)

Covers several programming languages and compares styles, philosophy, and design principles. Principles underlying declarative, functional, and object-oriented programming styles are studied. Students write programs emphasizing each of these techniques. (Formerly Computer Science 112.)

Prerequisite: Prerequisite(s): CSE 101.

CSE 113 - Parallel and Concurrent Programming (5)

Introduction to parallel and concurrent programming. Topics include: types of parallel computers and programming platforms; design, implementation, and optimization of programs for parallel and multicore processors; basic and advanced programming techniques; performance analysis and load balancing; and selected parallel algorithms.

Prerequisite: Prerequisite(s): CSE 12 and CSE 101. CSE 120 recommended.

CSE 114A - Foundations of Programming Languages (5)

Problem solving emphasizing recursion, data abstraction, and higher-order functions. Introduction to types and type checking, modular programming, and reasoning about program

correctness. (Formerly CSE 116, Introduction to Functional Programming.)

Prerequisite: Prerequisite(s): CSE 101.

CSE 114B - Functional Programming (5)

An in-depth study of the functional style of programming and functional abstraction, including the study of applicative functors and monads, and monadic parsers. (Formerly CSE 114.)

Prerequisite: Prerequisite(s): CSE 114A. Enrollment is restricted to junior and senior computer science majors.

CSE 115A - Introduction to Software Engineering (5)

Emphasizes the characteristics of well-engineered software systems. Topics include requirements analysis and specification, design, programming, verification and validation, maintenance, and project management. Practical and research methods are studied. Imparts an understanding of the steps used to effectively develop computer software. (Formerly Computer Science 115.)

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements and CSE 101 and CSE 130.

CSE 115B - Software Design Project (5)

Students in teams specify, design, construct, test, and document a complete software system in a specialized application domain. Class time is spent in technical discussions and ongoing design reviews. A formal presentation and demonstration of each project is required. An organizational meeting will be held during the preceding quarter. Projects may be drawn from industry and campus research groups. (Formerly Computer Science 116.)

Prerequisite: Prerequisite(s): CSE 115A.

CSE 115C - Software Design Project II (5)

Continuation of CSE 116. Students work in teams to develop, test, document, and deploy a substantial software project. Teams give a formal presentation and demonstration of each project. (Formerly Computer Science 117.)

Prerequisite: Prerequisite(s): CSE 115B.

CSE 115D - Software Design Project - Accelerated (5)

Accelerated version of CSE 115B and CSE 115C. Students work in teams to develop, test, document and deploy a substantial software project. Each team gives a formal presentation and demonstration of their project. Students cannot receive credit for both CSE 115D and any part of the 115B-115C sequence.

Prerequisite: Prerequisite(s): CSE 115A.

CSE 117 - Open Source Programming (5)

Presents an opportunity to participate in Linux Kernel development--one of the preeminent open source projects. Through community involvement, students accelerate

comprehension of computer science fundamentals and display their understanding and experience relevant to other programming projects.

Prerequisite: Prerequisite(s): CSE 101 and CSE 12. Enrollment restricted to School of Engineering majors.

CSE 118 - Mobile Applications (5)

Introduces programming and application development for mobile devices. Covers the Android SDK and main programming platforms available on mobile devices, methodologies for developing native applications. Students build applications and learn about different Android application components such as Activities, Services, Broadcast Receivers, and Content Providers through course assignments. Course based on emulators and SDK tools, so ownership of a cell phone/tablet is not required for the course. (Formerly CMPS 121.)

Prerequisite: Prerequisite(s): CSE 101.

CSE 119 - Software for Society (5)

Provides experience with applying computing to social issues. Case studies on multiple issues. For example: privacy, copyright, voting, education, poverty, energy, activism. Team project in which students develop software to address a pre-identified need of a global or local non-profit. (Formerly Computer Science 119.)

Prerequisite: Prerequisite(s): CSE 101.

CSE 120 - Computer Architecture (5)

Introduction to computer architecture including examples of current approaches and the effect of technology and software. Computer performance evaluation, basic combinatorial and sequential digital components, different instruction set architectures with a focus on the MIPS ISA and RISC paradigm. Evolution of CPU microarchitecture from single-cycle to multi-cycle pipelines, with overview of super-scalar, multiple-issue and VLIW. Memory system, cache, virtual memory and relationship between memory and performance. Evolution of PC system architecture. May include advanced topics, such as parallel processing, MIMD, and SIMD.

Prerequisite: Prerequisite(s): CSE 12; and CSE 13E, or CSE 13S, or ECE 13, or CSE 15 and CSE 15L. CSE 16 recommended.

CSE 121 - Embedded System Design (7)

The design and use of microprocessor-based embedded systems. Covers microprocessor and microcontroller architecture, programming techniques, bus and memory organization, DMA, timing issues, interrupts, peripheral devices, serial and parallel communication, and interfacing to analog and digital systems. (Formerly Microprocessor System Design, and formerly offered as two courses, CMPE 121 and CMPE 121L.)

Prerequisite: Prerequisite(s): CSE 12, CSE 100, CSE 100L; and CSE 13E or CSE 13S or ECE 13 or CSE 15 and CSE 15L; and ECE 101, ECE 101L, PHYS 5C and PHYS 5N.

CSE 122 - Introduction to VLSI Digital System Design (5)

Introduces very large scale integrated (VLSI) custom integrated circuits. Topics include: semiconductor manufacturing, logic families, field-effect transistors (FETs), interconnect models, simulation, and circuits. Introduces the design flow from logic design to layout with a focus on high performance and low power. Students cannot receive credit for this course and CSE 222A. (Formerly Computer Engineering 122.)

Prerequisite: Prerequisite(s): CSE 100, CSE 100L, ECE 101, and ECE 101L.

CSE 123A - Engineering Design Project I (5)

First of a two-course sequence that is the culmination of the engineering program. Students apply knowledge and skills gained in elective track to complete a major design project. Students complete research, specification, planning, and procurement for a substantial project. Includes technical discussions, design reviews, and formal presentations; engineering design cycle, engineering teams, and professional practices. Formal technical specification of the approved project is presented to faculty.

Prerequisite: Prerequisite(s): CSE 121; previous or concurrent enrollment in CSE 185E.

CSE 123B - Engineering Design Project II (7)

Second of two-course sequence in engineering system design. Students fully implement and test system designed and specified in CSE 123A. Formal written report, oral presentation, and demonstration of successful project to review panel of engineering faculty required.

Prerequisite: Prerequisite(s): CSE 123A, and CSE 185E or CSE 185S.

CSE 125 - Logic Design with Verilog (7)

Verilog digital logic design with emphasis on ASIC and FPGA design. Students design and verify large-scale systems. Assignments and project use the Verilog Hardware Description Language with emphasis on verification and high-frequency ASIC/FPGA targets. May be taught in conjunction with CSE 225. Students cannot receive credit for both courses.

Prerequisite: Prerequisite(s): CSE 100 and CSE 100L and CSE 120.

CSE 129A - Capstone Project I (2)

First of a three-course sequence in which students apply knowledge and skills gained in elective track to complete a major design project. In this first course, students complete the specification and planning for a substantial project. Topics covered: engineering design cycle, engineering teams, and professional practices. (Formerly Computer Engineering 129A.)

Prerequisite: Prerequisite(s): previous or concurrent enrollment in courses CSE 121 and CSE 121L. Enrollment is restricted to bioengineering, biomolecular engineering and bioinformatics, computer engineering, and robotics engineering majors.

CSE 129B - Capstone Project II (5)

Second of a three-course sequence in which students apply knowledge and skills gained in elective track to complete a major design project. In this second course, students complete the research and procurement for a substantial project and a preliminary implementation. Prerequisite(s): CSE 121, CSE 121L, and CSE 129A. Previous or concurrent enrollment in CSE 185. Enrollment by permission of instructor.

CSE 129C - Capstone Project III (5)

Third of a three-course sequence in which students apply knowledge and skills gained in elective track to complete a major design project. In this third course, students work in teams to complete the project specified and advanced in the first two courses. A formal written report, oral presentation, and demonstration of the successful project to a review panel of engineering faculty is required. Prerequisite(s): CSE 129B and CSE 185. Enrollment by permission of instructor.

CSE 130 - Principles of Computer Systems Design (5)

Covers the principles governing computer-systems design and complexity; familiarity with memory, storage, and networking; concurrency and synchronization; layering (abstraction and modularity); naming; client-server and virtualized system models; and performance. Requires significant programming projects demonstrating mastery of these concepts.

Prerequisite: Prerequisite(s): CSE 12; and CSE 101, or CSE 15 and CSE 15L; and knowledge of C programming language.

CSE 132 - Computer Security (5)

Introduction to computer security (including selected topics in network security). Access control. Security in programming languages. Basic cryptography. Security protocols. (Formerly CMPS 122.)

Prerequisite: Prerequisite(s): CSE 130 or CSE 131 or permission of instructor. Enrollment restricted to School of Engineering majors.

CSE 134 - Embedded Operating Systems (5)

Detailed exploration of the internal design of an embedded operating systems kernel. Covers kernel structure and organization, device drivers, I/O systems, file systems, memory management, and security. Students complete significant programming projects that extend or modify existing operating systems. (Formerly Computer Engineering 114.)

Prerequisite: Prerequisite(s): CSE 120 and CSE 130.

CSE 138 - Distributed Systems (5)

Covers topics in distributed computing including communication, naming, synchronization, consistency and replication, fault tolerance, and security. Examples drawn from peer-to-peer systems, online gaming, the World Wide Web; other systems also used to illustrate approaches to these topics. Students implement simple distributed systems over the course of the quarter. (Formerly CMPS 128, Distributed Systems: File Sharing, Online Gaming, and More.)

Prerequisite: Prerequisite(s): CSE 130 or CSE 131.

CSE 140 - Artificial Intelligence (5)

Introduction to the contemporary concepts and techniques of artificial intelligence, including any or all of: machine perception and inference, machine learning, optimization problems, computational methods and models of search, game playing and theorem proving. Emphasis may be on any formal method of perceiving, learning, reasoning, and problem solving which proves to be effective. This includes both symbolic and neural network approaches to artificial intelligence. Issues discussed include symbolic versus nonsymbolic methods, local versus global methods, hierarchical organization and control, and brain modeling versus engineering approaches. Lisp or Prolog may be introduced. Involves one major project or regular programming assignments. (Formerly CMPS 140.)

Prerequisite: Prerequisite(s): CSE 101.

CSE 142 - Machine Learning (5)

Introduction to machine learning algorithms and their applications. Topics include classification learning, density estimation and Bayesian learning regression, and online learning. Provides introduction to standard learning methods such as neural networks, decision trees, boosting, and nearest neighbor techniques. (Formerly CMPS 142.)

Prerequisite: Prerequisite(s): CSE 101; and AM 30, or MATH 22, or MATH 23A; and STAT 131 or CSE 107.

CSE 143 - Introduction to Natural Language Processing (5)

Introduces the theory and practice of natural language processing (NLP)--the creation of computer programs that can understand, generate, and learn natural language. Introduces the three major subfields of NLP: syntax (the structure of a sentence); semantics (the explicit meaning of a single sentence); and pragmatics (the implicit meaning of a sentence when it is used in a specific discourse). Projects focus on the techniques useful for a particular application area, alternating in different years. Project application areas include information extraction, narrative understanding, sentiment analysis, dialogue systems, and question answering. (Formerly CMPS 143.)

Prerequisite: Prerequisite(s): CSE 101, and CSE 107 or STAT 131. Python competence equivalent to CSE 30 is highly recommended.

CSE 144 - Applied Machine Learning (5)

Provides a practical and project-oriented introduction to machine learning, with an emphasis on neural networks and deep learning. Starts with a discussion of the foundational pieces of statistical inference, then introduces the basic elements of machine learning: loss functions and gradient descent. Using these, presents logistic regression, or one-layer networks, and then moves on to more complex models: deep neural networks, convolutional networks for image recognition, and recurrent networks and LSTM for temporal and sequence data. Also covers the basics of dataset preparation and visualization and the performance characterization of the

models created. Includes weekly homework and a final project that can be done in groups. (Formerly CMPS 144.)

Prerequisite: Prerequisite(s): CSE 101. Enrollment is restricted to juniors and seniors.

CSE 145 - Introduction to Data Mining (5)

Covers the techniques, algorithms, and applications of data mining, including data preprocessing, data exploration, classification, clustering, mining text, and sequential and social data. (Formerly TIM 145.)

Prerequisite: Prerequisite(s): CSE 15 and CSE 15L or CSE 30 or CSE 13S; and AM 30 or MATH 22 or MATH 23A; and STAT 5 or CSE 107 or STAT 131; and AM 10 or MATH 21; and CSE 16 or ECON 113. Enrollment restricted to juniors and seniors. Graduate students by permission of instructor.

CSE 146 - Ethics and Algorithms (5)

Provides an introduction to data-driven and algorithmic decision making, and ethical frameworks for evaluating automated systems. Emphasis on algorithmic literacy, critical analysis, and fundamental limitations of automated decision making. Covers concepts including predictive and causal modeling. Discusses bias, fairness, interpretability, privacy, and accountability. Finally, discusses notions of autonomy and algorithmic auditing.

Prerequisite: Prerequisite(s): CSE 101; and CSE 107 or STAT 131. CSE 142 and CSE 140 are recommended.

CSE 150 - Introduction to Computer Networks (5)

Addresses issues arising in organizing communications among autonomous computers. Network models and conceptual layers; Internet-working; characteristics of transmission media; switching techniques (packet switching, circuit switching, cell switching); medium access control (MAC) protocols and local area networks; error-control strategies and link-level protocols; routing algorithms for bridges and routers; congestion control mechanisms; transport protocols; application of concepts to practical wireless and wireline networks and standard protocol architectures. Students who have completed CSE 80N can take this course for credit.

Prerequisite: Prerequisite(s): CSE 16 and CSE 12; and CSE 30, or CSE 15 and CSE 15L. Concurrent enrollment in CSE 150L is required.

CSE 150L - Introduction to Computer Networks Laboratory (2)

Illustrates the concepts covered in CSE 150 and provides students with hands-on experience in computer networks.

Prerequisite: Prerequisite(s): CSE 16 and CSE 12; and CSE 30 or CSE 15 and CSE 15L. Concurrent enrollment in CSE 150 is required.

CSE 151 - Advanced Computer Networks (5)

Provides an in-depth coverage of fundamental topics introduced in course 150 including routing, transport, and internetworking. Also introduces advanced concepts not covered in CSE 150

including wireless, application-layer services, security, etc. (Formerly Computer Engineering 151.)

Prerequisite: Prerequisite(s): CSE 150. Concurrent enrollment in CSE 151L is required.

CSE 151L - Advanced Computer Networks Laboratory (2)

Laboratory illustrating the concepts covered in CSE 151; provides students with hands-on experience in computer networks. (Formerly Computer Engineering 151L.)

Prerequisite: Prerequisite(s): CSE 150 and CSE 150L. Concurrent enrollment in CSE 151 is required.

CSE 152 - Principles of Computer Communication (5)

Course focuses on the design and analysis of protocols for computer communication. Topics include: the safety, liveliness, and performance of communication protocols for medium access control (MAC); link control; routing and switching; multicasting; and end-to-end transport. Students cannot receive credit for this course and CSE 250B.

Prerequisite: Prerequisite(s): CSE 107, CSE 150, and CSE 150L.

CSE 156 - Network Programming (5)

Methods and tools used for network programming. Topics include: operating system (OS) support for network protocols; inter-process communication (IPC) facilities, such as pipes, sockets, and remote procedure call (RPC); design of client and server sides of network applications; network security; and programming projects. (Formerly Computer Engineering 156.)

Prerequisite: ,Prerequisites: CSE 150, CSE 150L and CSE 101. Concurrent enrollment in course CSE 156L is required.

CSE 156L - Network Programming Laboratory (2)

Laboratory sequence illustrating concepts taught in CSE 156. Students learn use of network programming tools and methods via programming exercises. (Formerly Computer Engineering 156L.)

Prerequisite: Prerequisites: CSE 150, CSE 150L, and CSE 101. Concurrent enrollment in CSE 156 is required.

CSE 157 - Internet of Things (7)

Introduces the key concepts and techniques in the design of Internet of Things (IoT). Topics include dominant architectures and protocols for IoT, wireless infrastructure for IoT, hardware and software development methodologies, embedded software design for IoT, cloud software for IoT, and network and system security. Students work in teams on a project to design, prototype, and test a complete IoT system.

Prerequisite: Prerequisite(s): CSE 121 and CSE 121L and CSE 150 and CSE 150L.

CSE 160 - Introduction to Computer Graphics (5)

Introduces techniques of modeling, transformation, and rendering for computer-generated imagery. Topics: 2D/3D primitives, projections, matrix composition, and shading

algorithms. Programming assignments and major project required. Students cannot receive credit for both this course and course 260 in quarters when they are offered concurrently. Mastery of materials in the prerequisite courses will be verified with a quiz or assignment during the first two weeks of the course. (Formerly Computer Science 160.)

Prerequisite: Prerequisite(s): CSE 101 and MATH 21 or AM 10. Concurrent enrollment in CSE 160L is required.

CSE 160L - Introduction to Computer Graphics Laboratory (2)

Complements CSE 160, gaining additional competence with a number of important software development tools, graphics libraries, and graphical user interfaces. Topics include OpenGL, WebGL, rubberbanding, picking, sliders, buttons, dialog, event handling, double buffering, lighting, shading, materials, and textures. The topic list may be updated to reflect technological changes. (Formerly CMPS 160L.)

Prerequisite: Concurrent enrollment in CSE 160 is required.

CSE 161 - Introduction to Data Visualization (5)

Concepts and methods for data analysis, information and scientific visualization, and effective communication of technical data. Topics include: mathematical foundations; scalar, vector, and tensor field visualization; multivariate visualization; and tree and graph visualizations. Applications are drawn from social-network analysis; environmental and space science; and medical imaging. Evaluation based on examinations, programming exercises, and a project. (Formerly CMPS 161.)

Prerequisite: Prerequisite(s): CSE 160 or equivalent. Concurrent enrollment in CSE 161L is required.

CSE 161L - Data Visualization Laboratory (2)

Complements CSE 161. Students gain additional competence with a number of important software development tools and techniques. Included are Paraview, Visualization Toolkit (VTK), and Insight Toolkit (ITK). Students get hands-on experience with designing transfer functions, isosurfacing, direct volume rendering, vector-field visualization techniques, as well as methods for dealing with non-spatial data. (Formerly CMPS 161L.)

Prerequisite: Concurrent enrollment in CSE 161 is required.

CSE 162 - Advanced Computer Graphics and Animation (5)

Covers concepts and methods for modeling and rendering static and dynamic scenes. Topics include: mathematical foundations (e.g., splines and numerical integration; global illumination models; texture mapping; morphing; physically based animation; behavioral animations; and procedural animations. Evaluation based on examinations, programming exercises, and a project. (Formerly CMPS 162.)

Prerequisite: Prerequisite(s): CSE 160 or equivalent. Concurrent enrollment in CSE 162L is required.

CSE 162L - Advanced Computer Graphics and Animation

Laboratory (2)

Complements CSE 162. Students gain additional competence in a hands-on computational laboratory setting. Representative examples include topics, such as interactive curve and surface design; shaders for advanced effects; crowd and behavioral animation; experiments with particle systems; facial animation; and motion and planning. (Formerly CMPS 162L.)

Prerequisite: Prerequisite(s): concurrent enrollment in CSE 162 is required.

CSE 163 - Data Programming for Visualization (5)

Presents the basics of open-source programming tools to perform data analysis and create interactive visualizations and maps for the web, data integrity and scraping, statistical computation, simple and novel visualizations, and geomapping. The examples are drawn from social science, public policy, and data journalism. (Formerly CMPS 165.)

Prerequisite: Prerequisite(s): CSE 101.

CSE 165 - Human-Computer Interaction (5)

Theory and hands-on practice to understand what makes user interfaces usable and accessible to diverse individuals. Covers human senses and memory and their design implications, requirement solicitation, user-centered design and prototyping techniques, and expert and user evaluations. Interdisciplinary course for social science and engineering majors. Students cannot receive credit for this course and CSE 265 or DANM 231. (Formerly Computer Engineering 131.)

Prerequisite: Prerequisite(s): CSE 15.

CSE 167 - Mobile Sensing and Interaction (5)

Provides hands-on knowledge and experience with modern mobile computing platforms for sensing and interactions tasks. Students learn how to create usable applications on a sensor-laden, mobile computing platform with adequate level of user interface.

Prerequisite: Prerequisite(s): CSE 13S; or CSE 13E or ECE 13; or CSE 15 and CSE 15L; and PHYS 5A or PHYS 6A; and AM 10 or MATH 21.

CSE 168 - Introduction to Augmented Reality and Virtual Reality (7)

Covers the concepts and methods needed to develop augmented reality (AR) and virtual reality (VR) applications. Topics include 3D modeling, graphics rendering, image compositing, occlusion handling, sensors, computer vision and image analysis, toolkits for AR, different display options, dynamics, interaction, and navigation. Prerequisite(s): CSE 160 and CSE 160L. Some knowledge of mobile platforms (e.g., CSE 118 or CSE 167) is helpful, but not required. Enrollment is by instructor permission. Enrollment is restricted to juniors and seniors. (Formerly CMPS 168.)

CSE 180 - Database Systems I (5)

Introduction to the concepts, approaches, tools, and methodology of database design. Covers the entity-relationship

model, the relational model, relational algebra, relational calculus, commercial languages (such as SQL and QBE), functional dependencies, normal forms, and design theory. Other topics may include knowledge-bases, constraint databases, and alternative database models. Students that have taken and passed CSE 182 may not take CSE 180 for credit. (Formerly CMPS 180.)

Prerequisite: Prerequisite(s): CSE 101.

CSE 181 - Database Systems II (5)

Introduction to the architecture and implementation of database systems. Topics covered include data storage, tree and hash indexes, storage management, query evaluation and optimization, transaction management, concurrency control, recovery, and XML data management. (Formerly CMPS 181.)

Prerequisite: Prerequisite(s): CSE 180.

CSE 182 - Introduction to Database Management Systems (5)

Concepts, approaches, tools, and methodology of database design. Topics include the entity-relationship model; the relational data model; normal forms; commercial languages such as SQL (SQL constraints, SQL triggers, and update languages); query-by-example (QBE); XML data model, and XML query language (XQuery); as well as relational database-management support for XML and object-relational features in database-management systems. Involves a database -application development project. Students that have taken and passed CSE 180 cannot receive credit for CSE 182.

Prerequisite: Prerequisite(s): CSE 15 and CSE 15L or CSE 13E or CSE 13S or ECE 13. Course intended for non-majors; computer science majors should enroll in CSE 180.

CSE 183 - Web Applications (5)

The World-Wide Web is one of the main mechanisms by which computer applications are delivered to users. This course introduces the design of Web applications. Students learn the main technologies involved, and build web applications as part of homework assignments and group class projects. (Formerly CMPS 183.)

Prerequisite: Prerequisite(s): CSE 15 and CSE 15L, or CSE 35, or CSE 101.

CSE 184 - Data Wrangling and Web Scraping (5)

Python basics; data extraction from CSV, JSON, XML, Excel, PDF, encoded text files; data cleaning, finding duplicates, missing data, fuzzy matching; data exploration, joining, aggregating, separating, correlation, clustering; web scraping, APIs, scraping data from social media, open data network. (Formerly CMPS 184.)

Prerequisite: Prerequisite(s): CSE 101.

CSE 185E - Technical Writing for Computer Science and Engineering (5)

Writing by engineers and computer scientists to technical audiences. Writing exercises include: cover letter and resume for job application, tutorial writing, grant proposal, document

specification, literature review, and a final technical report. Two oral presentations are also required, an in-class presentation and a poster presentation. Students also receive instruction in the use of UC library and journal database resources, and in the writing of a statement of purpose for graduate school application. Also offered as CSE 185S. (Formerly Computer Engineering 185, Technical Writing for Computer Engineers.)

Prerequisite: Prerequisite(s): satisfaction of Entry Level Writing and Composition requirements; and CSE 12 or CSE 15 or CSE 30 or BME 160 or by permission of the instructor. Enrollment is restricted to computer engineering, bioengineering, bioinformatics, biomolecular engineering and bioinformatics, or network and digital technology majors. Crosslisted as: Prerequisite(s): CSE 101, one additional upper-division CSE course, and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to computer science majors, or by permission of the instructor. .

CSE 191 - Computer Science and Technology Seminar (2)

Weekly talks by industry experts, university researchers, field practitioners, and video presentations provide an in-depth exposure to a specific or a broad area of computer science and technology. Topics include emerging ideas, opportunities, challenges, and future of the industry. (Formerly CMPS 191.)

CSE 192 - Supervised Student Teaching/Tutoring (5)

Students hold tutoring hours, run a lab, or lead discussion section in conjunction with a regularly offered course and under close supervision by the course's instructor. Weekly meetings with a regular faculty member to discuss teaching techniques, pedagogy, sensitivity to students' needs, maintaining a comfortable learning environment, and strategies for handling difficult situations. Students submit a report on their teaching experience. Enrollment by permission of instructor and restricted to sophomores, juniors, and seniors. (Formerly CMPS 192.)

CSE 192F - Supervised Student Teaching/Tutoring (2)

Students hold tutoring hours, run a lab, or lead discussion section in conjunction with a regularly offered course and under close supervision by the course's instructor. Weekly meetings with a regular faculty member to discuss teaching techniques, pedagogy, sensitivity to students' needs, maintaining a comfortable learning environment, and strategies for handling difficult situations. Students submit a report on their teaching experience. Enrollment by permission of instructor and restricted to sophomores, juniors, and seniors. (Formerly CMPS 192F.)

CSE 193 - Field Study (5)

Provides for individual programs of study with specific academic objectives carried out under the direction of a faculty member of the Computer Engineering Department and a willing sponsor at the field site using resources not normally available on campus. Credit is based on the presentation of evidence of achieving the objectives by submitting a written and oral presentation. May not be repeated for credit. Students submit petition to sponsoring agency.

CSE 193F - Field Study (2)

Provides for individual programs of study with specific academic objectives carried out under the direction of a faculty member of the Computer Engineering Department and a willing sponsor at the field site using resources not normally available on campus. Credit is based on the presentation of evidence of achieving the objectives by submitting a written and oral presentation. May not be repeated for credit. Students submit petition to sponsoring agency.

CSE 194 - Group Tutorial (5)

A program of independent study arranged between a group of students and a faculty member. Students submit petition to sponsoring agency.

CSE 194F - Group Tutorial (2)

A program of independent study arranged between a group of students and a faculty member. Students submit petition to sponsoring agency.

CSE 195 - Senior Thesis Research (5)

Students submit petition to sponsoring agency. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Computer Engineering majors, CSE 123A or CSE 129A.

CSE 195F - Senior Thesis Research (2)

Students submit petition to sponsoring agency. Consent of instructor required. Prerequisite: CSE 123A.

CSE 198 - Individual Study or Research (5)

Students submit petition to sponsoring agency.

CSE 198F - Individual Study or Research (2)

Students submit petition to sponsoring agency.

CSE 199 - Tutorial (5)

For fourth-year students majoring in computer engineering. Students submit petition to sponsoring agency.

CSE 199F - Tutorial (2)

For fourth-year students majoring in computer engineering. Students submit petition to sponsoring agency.

Graduate**CSE 200 - Research and Teaching in Computer Science and Engineering (3)**

Basic teaching techniques for teaching assistants, including responsibilities and rights of teaching assistants, resource materials, computer security, leading discussion or lab sessions, presentation techniques, maintaining class records, electronic handling of homework, and grading. The course examines research and professional training, including use of the library and online databases, technical typesetting, writing journal and conference papers, publishing in computer science and computer engineering, giving talks in seminars and conferences,

and ethical issues in science and engineering. Required for all teaching assistants. Formerly CMPS 200 and CMPE 200.)

Prerequisite: Enrollment is restricted to graduate students.

CSE 201 - Analysis of Algorithms (5)

Rigorous analysis of the time and space requirements of important algorithms, including worst case, average case, and amortized analysis. Techniques include order-notation, recurrence relations, information-theoretic lower bounds, adversary arguments. Analysis of the key data structures: trees, hash tables, balanced tree schemes, priority queues, Fibonacci and binomial heaps. Algorithmic paradigms such as divide and conquer, dynamic programming, union-find with path compression, augmenting paths. Selected advanced algorithms. Introduction to NP-completeness. (Formerly Computer Science 201.)

Prerequisite: Enrollment is restricted to graduate students; undergraduate students may enroll in this course if they have completed CSE 102 or CSE 106 and have the consent of the instructor.

CSE 202 - Combinatorial Algorithms (5)

Fundamental combinatorial algorithms, graph algorithms, flow problems, matching problems, linear programming, integer programming, NP-completeness, approximation algorithms for optimization problems. (Formerly Computer Science 211.)

Prerequisite: Prerequisite(s): CSE 201.

CSE 204 - Computational Models and Complexity (5)

Finite automata and regular expressions, universal models of computation, computability and unsolvability, relations between complexity classes, hierarchy theorems, reductions, complete problems for the major complexity classes (L, NL, P, NP, PSPACE). Other topics may include complexity of counting and enumeration problems, complexity of approximation, randomized complexity classes. (Formerly Computer Science 210.)

Prerequisite: Prerequisite(s): CSE 201.

CSE 205 - Logic in Computer Science (5)

The applications and uses of formal systems to computer science. Covers the syntax and semantics of propositional logic and first-order logic, normal forms, soundness and completeness theorems, Herbrand's theorem, unification and resolution, foundations of logic programming, automated theorem proving. Other topics may include deductive databases, database query languages, nonmonotonic reasoning. (Formerly Computer Science 217.)

Prerequisite: Enrollment is restricted to graduate students.

CSE 207 - Graph Algorithms (5)

Explores graph theory and algorithms for solving problems in engineering. A review of basic graph concepts and algorithms is followed by topics in network flow, partitioning, spectral analysis of graphs, graph isomorphism, and intractability. (Formerly Computer Engineering 277.)

Prerequisite: Prerequisite(s): CSE 101 and CSE 102; or CSE 106; or CSE 201; or equivalent. Enrollment is restricted to graduate students.

CSE 210A - Programming Languages (5)

Covers current issues in programming languages. Language topics include object oriented, concurrent, functional, and logic programming, and other programmable applications such as symbolic manipulators and simulation. (Formerly Computer Science 203.)

Prerequisite: Enrollment is restricted to graduate students; undergraduate students may enroll for this course if they have completed CSE 112 and have the consent of the instructor.

CSE 210B - Advanced Programming Languages (5)

Covers issues in the design, implementation, analysis, and specification of programming languages. Topics include formal semantics (including operational, axiomatic, and denotational semantics), advanced type systems, program analysis (including abstract interpretation and model checking), specification, and verification. (Formerly Computer Science 253.)

Prerequisite: Prerequisite(s): CSE 210A or equivalent.

CSE 211 - Compiler Design (5)

Advanced study of compiler implementation. Topics include compiler structure back end, run-time environments, storage management, garbage collection, register allocation, code generation, basic blocks, control flow, data flow, local and global optimization, interpretation, machine code generation. Students may not receive credit for this course and CSE 110B. Taught in conjunction with CSE 110B. (Formerly Computer Science 204.)

Prerequisite: Prerequisite(s): CSE 110A or equivalent. Enrollment is restricted to graduate students.

CSE 212A - Software Engineering (5)

Introduction to the general principles of software engineering. Covers current and classical topics from both practical and theoretical viewpoints. Topics include software evolution, project management, software inspections, design methods, requirements analysis and specification, software testing, maintenance, software implementation, human interfaces, and software engineering experimentation. (Formerly CMPS 276.)

Prerequisite: Enrollment is restricted to graduate students; undergraduates may enroll in this course if they have completed CSE 115A.

CSE 212B - Software Reuse and Component-Based Software Engineering (5)

Detailed study of interlocking business, organizational, and technical issues in large-scale software reuse and component-based software engineering. Topics include architecture, design for reuse, domain engineering, model-driven development, domain-specific kits, components, frameworks, software agents, generators, problem-oriented languages, library design, reuse

tools, patterns, and aspects. Assumes prior exposure to software engineering topics. (Formerly Computer Science 279.)

Prerequisite: Prerequisite(s): CSE 212A or consent of instructor. Enrollment is restricted to graduate students.

CSE 214 - Principles of Database Systems (5)

Advanced course on principles of database systems. Main topics include overview of the relational data model and relational query languages; recursive queries, datalog, and fixed-points; query processing and optimization; database design, dependencies, normal forms, and the chase procedure. Additional topics may include information integration, complex objects, semistructured data, and XML. (Formerly Computer Science 277.)

Prerequisite: Prerequisite(s): CSE 201 or equivalent or consent of instructor. Enrollment is restricted to graduate students.

CSE 215 - Design and Implementation of Database Systems (5)

Advanced course in implementation techniques for database systems. For students who wish to do research in databases or to learn more about large-scale data processing. Topics include: indexing of complex data; techniques for high-volume concurrency control; query processing and optimization; database recovery; parallel database system architectures; database systems for streaming data; approximate query answering. Additional topics may include: self-managing database systems; advanced query optimization techniques; and query processing techniques for semi-structured data. (Formerly Computer Science 278.)

Prerequisite: Prerequisite(s): CSE 181 (or equivalent) or consent of instructor. Enrollment is restricted to graduate students.

CSE 216 - Formal Methods (5)

Mathematical techniques for analyzing systems to prove rigorous guarantees about their behavior. Fundamental algorithms for and advanced topics in modeling, specification, verification, correct-by-construction synthesis, and testing. Applications to hardware/software design, cybersecurity, robotics, machine learning. Course includes a final project.

Prerequisite: Prerequisite(s): CSE 103 or equivalent recommended, but not required. Enrollment is restricted to graduate students; undergraduates may enroll by permission of instructor.

CSE 220 - Computer Architecture (5)

Provides a thorough and fundamental treatment of the art of computer architecture. Topics include concepts of von Neumann architectures, methods of evaluating CPU performance, instruction-set design and examples, compiler issues, instruction pipelining, superscalar processors, methods for reduction of branch penalty, memory hierarchies, I/O systems, floating-point arithmetic, and current issues in parallel processing. (Formerly CMPE 202.)

Prerequisite: Enrollment is restricted to graduate students; undergraduates may enroll if they have completed CSE 120 and

with consent of instructor. A basic knowledge of computer architecture, similar to the content of CSE 120, is recommended.

CSE 221 - Advanced Microprocessor Design (5)

Introduction to latest advances in computer architecture. Focuses on processor core design. Topics include simultaneous multithreading, thread level speculation, trace caches, novel out-of-order mechanisms, and energy-efficient processor core designs. Final project is modification/enhancement of an out-of-order processor on an FPGA development system. (Formerly Computer Engineering 221.)

Prerequisite: Prerequisite(s): CSE 220; and CSE 125, CSE 225, or equivalent Verilog experience. Concurrent enrollment in CSE 221L is required. Enrollment restricted to graduate students.

CSE 221L - Advanced Microprocessor Design Laboratory (3)

Laboratory sequence illustrating topics covered in course 221. (Formerly Computer Engineering 221L.)

Prerequisite: Prerequisite(s): CSE 220; and CSE 125, CSE 225, or equivalent Verilog experience. Concurrent enrollment in CSE 221 is required. Enrollment restricted to graduate students.

CSE 222A - VLSI Digital System Design (5)

Advanced Very Large Scale Integrated (VLSI) custom integrated circuits. Topics include: semiconductors; field-effect transistors (FETs); circuits; and interconnect simulation, along with advanced material on manufacturability, variability, short-channel devices, and non-volatile memories. Students cannot receive credit for this course and CSE 122. (Formerly Computer Engineering 222.)

Prerequisite: Prerequisite(s): CSE 122 or equivalent.

CSE 222B - VLSI System-on-a-Chip Design (5)

Design methodologies for Application Specific Integrated Circuits (ASICs). Topics include: behavioral specification; logic synthesis; standard-cell libraries; advanced timing analysis; and physical design automation tools. Familiarizes students with real-world tools during the design of a small system-on-a-chip project. Students are encouraged to fabricate and test their chips in an independent study. (Formerly Computer Engineering 223.)

Prerequisite: Prerequisite(s): CSE 222A or permission of instructor. Enrollment is restricted to graduate students.

CSE 225 - Introduction to ASIC Systems Design (7)

Verilog digital logic design with emphasis on ASIC and FPGA design. Students design and verify large-scale systems. Assignments and project use the Verilog Hardware Description Language with emphasis on verification and high-frequency ASIC/FPGA targets. Course may be taught in conjunction with CSE 125.

Prerequisite: Prerequisite(s): CSE 120 or CSE 220. Enrollment is restricted to graduate students; undergraduates may enroll

with permission of instructor. Students with hardware background should consult instructor for permission to enroll.

CSE 226 - Advanced Parallel Processing (5)

Introduction to programming advanced parallel computer architecture. Topics may include: SIMD massively parallel processor arrays; streaming parallel coprocessors, such as graphics cards used for general-purpose processing (GPGPU); or other hybrid MIMD/SIMD architectures. Course has programming lab component, a project, and student presentation on related topics. (Formerly Computer Engineering 220.)

Prerequisite: Enrollment is restricted to graduate students; undergraduates may enroll with permission of instructor.

CSE 229 - Field-Programmable Gate Arrays Computer-Assisted Design (5)

Design methods for Field-Programmable Gate Arrays (FPGAs), including algorithms for technology mapping, routability estimation, placement, and routing. The relationship between FPGA architectures and their computer-aided design tools. Course project involves the modification and analysis of an FPGA tool. (Formerly Computer Engineering 229.)

Prerequisite: Enrollment is restricted to graduate students or by consent of instructor. CSE 100, CSE 125, CSE 222A, CSE 225, or other digital design experience recommended.

CSE 231 - Advanced Operating Systems (5)

A detailed study of the issues involved in operating systems design and implementation. Readings cover current research topics and systems of historical significance. Topics include (but are not restricted to) process and memory management, protection, security, synchronization, performance evaluation, file systems, distributed systems. (Formerly Computer Science 221.)

Prerequisite: Enrollment is restricted to graduate students; undergraduates by interview only.

CSE 232 - Distributed Systems (5)

Overview of research topics in distributed computer systems. Topics may include communication paradigms, process management, naming, synchronization and coordination, consistency and replication, fault tolerance, and security. Examples include distributed operating systems, distributed file and object systems, distributed document systems, and peer-to-peer systems. (Formerly Computer Science 232.)

Prerequisite: Enrollment is restricted to graduate students.

CSE 233 - Advanced Computer Security (5)

Overview of research topics in computer and network security. Topics may include cryptographic operations, security properties and policies, authentication and access control, attacks on computer systems and defenses against them, security in programming languages, and network protocols for security. (Formerly CMPS 223.)

Prerequisite: Enrollment is restricted to graduate students or consent of instructor.

CSE 234 - Understanding Cryptography (5)

Cryptography has become ubiquitous, from light bulbs to atomic weapons. This course provides both a comprehensive introduction to applied cryptography and an additional focus on the human issues caused by bad implementations, bad processes, and broken algorithms. Knowledge of C Programming, Linux, and Virtual machines is required. (Formerly Computer Engineering 236 and Computer Science 236.)

Prerequisite: Prerequisite(s): CSE 201. Enrollment is restricted to graduate students.

CSE 235 - Cyber-Physical Systems Security (5)

Cyber-physical systems now permeate our lives; they include autonomous vehicles, the Internet of things, and modern control of our critical infrastructure such as the power grid. Learning about the threats against these systems and the possible defenses is essential for computer security practitioners. In this course, students read and analyze the latest published research in this area, and work on projects to address new problems.

Prerequisite: Enrollment is restricted to graduate students.

CSE 237 - Storage Systems (5)

Topics include storage devices, storage architectures, local file systems, high-performance file systems, and next-generation storage devices and architectures; covers issues of performance, reliability, scalability, robustness, and security. (Formerly Computer Science 229.)

Prerequisite: Enrollment is restricted to graduate students.

CSE 240 - Artificial Intelligence (5)

Prepares students for doing research in artificial intelligence. Major topics covered are search and heuristics, knowledge representation, planning, deduction and inference, reinforcement learning, associative pattern retrieval, and adaptive search. Discussion includes current research issues in AI problem-solving methods. Individualized projects. (Formerly Computer Science 240.)

CSE 241 - Knowledge Engineering (5)

Introduction to the acquisition, representation, and application of knowledge in expert systems. Topics include production systems, backward and forward chaining, dependency-directed backtracking, reasoning with uncertainty, certainty factors, fuzzy systems, knowledge representation (rules, frames, and semantic nets), inference engines, and metaknowledge. Discussion includes current research issues in adaptive expert systems. Involves one major project. Undergraduates may enroll in this course if they have completed CSE 140. (Formerly Computer Science 241.)

CSE 242 - Machine Learning (5)

Introduction to machine learning algorithms. Covers learning models from fields of statistical decision theory and pattern

recognition, artificial intelligence, and theoretical computer science. Topics include classification learning and the Probably Approximately Correct (PAC) learning framework, density estimation and Bayesian learning, EM, regression, and online learning. Provides an introduction to standard learning methods such as neural networks, decision trees, boosting, nearest neighbor, and support vector machines. Requirements include one major experimental learning project or theoretical paper. Students may not receive credit for both this course and CSE 142. (Formerly CMPS 242.)

Prerequisite: Enrollment is restricted to graduate students in the computer science and engineering, computer engineering and computer science master's programs; and students in the following doctoral programs: computer science and engineering, computer engineering, computer science, applied mathematics, applied mathematics and statistics, biomolecular engineering and bioinformatics, electrical and computer engineering, electrical engineering, statistical science, and technology information management. Others may enroll by permission of the instructor.

CSE 243 - Data Mining (5)

Covers the principles, algorithms, and applications of data mining, including mining sequential data, structured data, stream data, text data, spatiotemporal data, biomedical data, and other forms of complex data. Formerly TIM 245.)

Prerequisite: Enrollment is restricted to graduate students.

CSE 244A - Foundations of Deep Learning (5)

Provides foundations of deep learning algorithms and principles. Topics include neural networks, deep learning principles, deep learning architectures such as convolutional neural networks and recurrent neural networks, autoencoders, generative adversarial networks, and reinforcement learning. (CSE 244A and CSE 244B formerly offered as one course, CSE 244.)

Prerequisite: Prerequisite(s): CSE 201 and familiarity with basic machine learning concepts. Enrollment is restricted to computer science and engineering graduate students.

CSE 244B - Machine Learning for Natural Language Processing (5)

Introduction to machine learning models and algorithms for Natural Language Processing. Covers deep learning approaches and traditional machine learning models. Topics include an introduction to standard neural network learning methods such as feed-forward neural networks, recurrent neural networks, convolutional neural networks, and encoder-decoder models with applications to natural language processing problems such as utterance classification and sequence tagging. Requirements include a midterm, final, programming assignments, and a project. (CSE 244A and CSE 244B formerly offered as one course, CSE 244.)

Prerequisite: Prerequisite: CSE 244A.

CSE 245 - Computational Models of Discourse and Dialogue (5)

Focuses on classic and current theories and research topics in the computational modeling of discourse and dialogue, with applications to human-computer dialogue interactions; dialogue interaction in computer games and interactive story systems; and processing of human-to-human conversational and dialogue-like language such as e-mails. Topics vary depending on the current research of the instructor(s) and the interests of the students. Students read theoretical and technical papers from journals and conference proceedings and present class lectures. A research project is required.

Prerequisite: Enrollment is restricted to graduate students. Undergraduates may enroll with permission of instructor.

CSE 246 - Responsible Data Science (5)

Graduate course covering basics of data science literacy and data science ethics. Topics include algorithmic discrimination, fairness, interpretability, privacy, and reproducibility. Key statistical topics such as generalization, causality, curse of dimensionality, and sampling bias are covered.

Prerequisite: Enrollment is restricted to graduate students.

CSE 247 - Projects in Artificial Intelligence (5)

Overview of artificial intelligence (AI) and machine learning (ML) and principles, implementation and deployment pipeline, and approaches in solving domain-related problems. Topics covered through direct instruction, invited guest speakers, reviews of state-of-art research papers, and a team project. Students are given an opportunity to work on a quarter-long AI/ML project to be counted toward their master's degree project requirements. Enrollment is by instructor consent. Prior experience in machine learning and deep learning is required. (Formerly AI: Problem Solving and Intelligent Search.)

CSE 248 - Foundations of Data Science (5)

Examines the mathematical and algorithmic foundations of data science including high dimensional data, probabilistic inequalities, dimensionality reduction, correlation detection, streaming algorithms, and clustering. (Formerly Computer Science 218.)

Prerequisite: Prerequisite(s): CSE 201. Enrollment is restricted to graduate students.

CSE 249 - Large-Scale Web Analytics and Machine Learning (5)

Provides a systematic methodology and corresponding set of methods and analytical tools in stochastic models; reinforcement learning; stochastic (neuro-)dynamic programming; Bayesian graphical models; inference; and social networks used for web analytics and machine learning to achieve business intelligence (BI) and support research and applications in computer science, computer engineering, and electrical engineering, applied mathematics and statistics, business, management, and economics. Includes exposure to Hadoop for large-scale computation. Students should have solid background in probability equivalent to statistics, stochastic, methods, calculus, (and preferably) stochastic processes and

optimization, or mathematical maturity and exposure to business intelligence and algorithms. (Formerly TIM 251.)

Prerequisite: Prerequisite(s): CSE 107 or STAT 131 or permission of instructor. Enrollment is restricted to graduate students.

CSE 250A - Computer Networks (5)

Issues resulting from organizing communication among autonomous computers. Includes network models and switching techniques; medium access control protocols and local area networks; error control and retransmission strategies; routing algorithms and protocols; congestion control mechanisms and end-to-end protocols; application-level protocols; and application of concepts to wireless and wireline networks, with emphasis on the Internet. (Formerly Computer Engineering 252A.)

Prerequisite: Enrollment is restricted to graduate students.

CSE 250B - Principles of Computer Communication (5)

Focuses on the design and analysis of protocols for computer communication. Topics include: the safety, liveliness, and performance of communication protocols for medium access control (MAC); link control; routing and switching; multicasting; and end-to-end transport. Students cannot receive credit for this course and CSE 152. (Formerly CMPE 252B.)

Prerequisite: Prerequisite(s): CSE 250A. Enrollment is restricted to graduate students.

CSE 250C - High Speed Computer Networks (5)

Fiber-optic technology; fiber-optic link design; network protocol concepts; coding and error control; high-speed local area and metropolitan area networks; gigabit networks; error and congestion control; photonic networks; research topics. (Formerly Computer Engineering 254.)

Prerequisite: Prerequisite(s): CSE 250B.

CSE 253 - Network Security (5)

Fundamental mechanisms for network security and their application in widely deployed protocols. In-depth treatment of security mechanism at the data-link, network, and transport layers for both wired and wireless networks. Covers mechanisms for privacy and integrity, and methods for intrusion detection. (Formerly CMPE 253.)

Prerequisite: Prerequisite(s): CSE 250A and CSE 201. Enrollment restricted to graduate students.

CSE 257 - Wireless and Mobile Networks (5)

An interdisciplinary course on wireless communication and mobile computing. Covers the physical aspects of wireless communication but emphasizes higher protocol layers. Topics include cellular networks, packet radio and ad hoc networks, wireless transport protocols, security, and application-level issues. (Formerly Computer Engineering 257.)

Prerequisite: Prerequisite(s): CSE 250A or permission of instructor.

CSE 259 - Sensor Networks (5)

Focuses on the networking aspects of sensor networks: protocols at the various layers and how they answer the specific requirements posed by these networks (e.g., data driven, energy efficient, etc.) and their applications (monitoring, tracking, etc.). Explores how physical layer and hardware issues may influence protocol design. (Formerly Computer Engineering 259.)

Prerequisite: Prerequisite(s): CSE 250A. CSE 257 is recommended as a prerequisite.

CSE 260 - Computer Graphics (5)

Introduces current research and techniques of modeling, 2D/3D transformation, matrix composition, shading algorithms, and rendering to obtain computer-generated imagery. Programming assignments and major project required. Students cannot receive credit for both this course and CSE 160. (Formerly Computer Science 260.)

Prerequisite: Enrollment is restricted to graduate students; undergraduates by interview only.

CSE 261 - Advanced Visualization (5)

Covers advanced topics in visualization, e.g., tensor-field visualization, uncertainty visualization, information visualization. Topics vary with differing offerings of the course. Course includes lectures, exam, research paper reading/presentation, and projects. Final project is expected to be at a sufficiently advanced level for submission to a conference. Students work individually or in pairs. (Formerly Computer Science 261.)

Prerequisite: Enrollment is restricted to graduate students.

CSE 262 - Computer Animation (5)

An in-depth treatment of computer animation, including its origins in conventional animation, 2-D animation, inbetweening, motion control, morphing, graphical motion editors, animation languages, motion blur, simulation of articulated body motion, real-time animation, and special-purpose animation hardware. (Formerly Computer Science 262.)

Prerequisite: Enrollment is restricted to graduate students.

CSE 263 - Data Driven Discovery and Visualization (5)

Explores high-quality interdisciplinary research using socio-economic data and software available on the Internet, and data curation, computation, and visualization to strengthen scientific inquiry to bear on large-scale societal problems. Applications include inequality, poverty, water, energy, environment, health, education, and democracy. Enrollment restricted to graduate students. Enrollment by instructor consent. (Formerly Computer Science 263.)

CSE 264 - Computer Vision (5)

Introduces general concepts in computer vision, with an emphasis on geometric 3D reconstruction. Topics include radiometry, photometry, projective geometry, geometric camera model, epipolar geometry, stereo depth reconstruction, corner

and edge features, point descriptors and matching, and optical flow. (Formerly Computer Engineering 264.)

Prerequisite: Enrollment is restricted to graduate students. Undergraduate students who are interested in enrolling should meet with the instructor first.

CSE 265 - Human-Computer Interaction (5)

Theory and hands-on practice to understand what makes user interfaces usable and accessible to diverse individuals. Covers human senses and memory and their design implications, requirement solicitation, user-centered design and prototyping techniques, and expert and user evaluations. Individual research project. Interdisciplinary course for art, social science and engineering graduate students. Students cannot receive credit for this course and CSE 165.

Prerequisite: Enrollment is restricted to graduate students.

CSE 272 - Information Retrieval (5)

Course covers major topics of information retrieval including: characteristics and representation of text, several important retrieval and ranking models, content recommendation and classification; distributed or federated search, AI semantics and dialog for information access; human factors and interfaces; and evaluation, and domain-specific applications. A research project is required. (Formerly TIM 260.)

Prerequisite: Enrollment is restricted to graduate students. Undergraduates may enroll with permission of instructor.

CSE 276 - Optimization Theory and Applications (5)

A first graduate course in optimization with an emphasis on problems arising in management and engineering applications. Objectives are to become experts in problem formulation, comfortable with software for solving these problems, and familiar with analytical methods behind these solver technologies. (Formerly TIM 206.)

Prerequisite: Prerequisite(s): calculus and linear algebra. Enrollment is restricted to graduate students.

CSE 277 - Random Process Models in Engineering (5)

A first graduate course in stochastic process modeling and analysis with an emphasis on applications in technology management, information systems design, and engineering. (Formerly TIM 207.)

Prerequisite: Enrollment is restricted to graduate students. Prerequisite: CSE 107 or other undergraduate probability course recommended.

CSE 279 - Data Mining and Business Analytics in Knowledge Services (5)

Provides students with systematic methodology and analytical tools in data and text mining and business analytics. Also provides an integrated perspective and examines use of these methods in the field of knowledge services, such as online marketing, sponsored search, health care, financial services, recommender systems, etc. Includes training in the basic elements of stochastic optimization and other algorithmic

approaches, such as stochastic dynamic programming, statistics, constrained optimization, and machine learning with exposure to software tools. These methods enable firms to achieve rapid, effective, and profitable optimization of knowledge-services management. (Formerly TIM 209.)

Prerequisite: Enrollment is restricted to graduate students. Students are expected to have undergraduate preparation in probability and statistics. Undergraduates may enroll with instructor approval.

CSE 280A - Seminar in Computer Science and Engineering (2)

Weekly seminar covering topics of current research in computer science. Enrollment by permission of instructor. (Formerly CMPS 280A, Seminar in Computer Science Research.)

CSE 280D - Seminar in Database Systems (2)

Covers advanced research topics from the recent literature in database systems and related fields. Involves presentations from UCSC students and faculty, and guest talks from researchers in industry and other academic institutions. Enrollment by permission of instructor. (Formerly 280D.)

CSE 280F - Seminar on Software Engineering (2)

Weekly seminar covering topics of current research in software engineering. (Formerly CMPS 280G.)

Prerequisite: Prerequisite(s): Enrollment is restricted to graduate students.

CSE 280G - VLSI/CAD Seminar (2)

Weekly seminar on advanced topics in VLSI and computer-aided design (CAD). Students present and discuss modern issues in semiconductor design, fabrication, and CAD. Frequent guest speakers present pertinent results from industry and academia. (Formerly Computer Engineering 280G.)

CSE 280H - Seminar in Human Computation Systems (2)

Covers advanced topics and current research in the general area of human computation. Material is drawn from several disciplines that involve or deal with human computation, including computer vision, human-computer interaction, databases, and machine learning. The course comprises presentations from faculty, enrolled students, and external visitors. (Formerly CMPS 280H.)

Prerequisite: Enrollment is restricted to graduate students.

CSE 280I - Seminar on Information Retrieval and Knowledge Management (2)

Seminar series discussing advanced topics in information retrieval and knowledge management. Current research and literature are presented during each meeting. (Formerly 280I.)

Prerequisite: Enrollment is restricted to graduate students.

CSE 280J - Seminar on Computer Graphics (2)

Weekly seminar covering topics of current research in computer graphics. Enrollment restricted to graduate students and by permission of instructor. (Formerly CMPS 280J.)

CSE 280K - Sales and Marketing for Technologists and Engineers (2)

Perspective on the theory, plus examples, and tools useful to technologists and engineers for successfully guiding and supporting sales and marketing endeavors and, thereby, ensuring funding, staffing, product appeal, positive customer relationships, and marketplace success. (Formerly TIM 280M.)

CSE 280L - Seminar on Logic in Computer Science (2)

Covers advanced research topics from the recent literature in the uses of logic in computer science with particular emphasis on the applications of logic to the representation and the management of data. Involves presentations from UCSC students and faculty, and guest talks from researchers in other academic institutions or industrial research labs. Enrollment is by permission of the instructor and is restricted to graduate students. (Formerly CMPS 280L.)

CSE 280M - Seminar on Machine Learning (2)

Weekly seminar covering topics of current interest in machine learning. Enrollment is by permission of the instructor. Enrollment is restricted to graduate students. (Formerly CMPS 280M.)

CSE 280N - Seminar on Networks (2)

Weekly seminar series covering topics of current research in networks and networked systems. Current research work and literature in these areas are discussed. Prerequisite(s): permission of instructor. Enrollment is restricted to graduate students. (Formerly Computer Engineering 280N.)

CSE 280O - Seminar in Applied Programming Languages (2)

Covers current research in language-based approaches to security, distributed systems, databases, and formal verification. Students read and present papers from academic journals and conferences.

Prerequisite: Enrollment is restricted to graduate students, or by permission of the instructor.

CSE 280P - Seminar on Parallel Processing (2)

Weekly seminar series covering topics of current research in parallel systems, architectures, and algorithms. Current research work and literature in these areas are discussed. (Formerly Computer Engineering 280P.)

Prerequisite: Enrollment is restricted to graduate students.

CSE 280S - Seminar on Computer Systems (2)

Weekly seminar series covering topics of current research in computer systems. Enrollment by permission of instructor. (Formerly CMPS 280S AND CMPE 280S.)

CSE 280T - Seminar on New Technologies (2)

Weekly seminar series in which distinguished speakers from industry, universities, and government discuss current developments in networking and computer technology. The emphasis is on open research questions that may lead to

collaborative work with faculty and graduate students. (Formerly Computer Engineering 280T.)

CSE 280V - Seminar on Computer Vision (2)

Weekly graduate-level seminar series discussing advanced topics in computer vision and image analysis. Current research and literature presented during each meeting. Enrollment is by permission of the instructor. Enrollment is restricted to graduate students. (Formerly Computer Engineering 280V.)

CSE 280X - Seminar in Distributed Systems (2)

Covers advanced research topics from the recent literature in distributed systems and related fields. Involves presentations from UCSC students and faculty. Enrollment is restricted to graduate students and by permission of the instructor.

CSE 280Z - Seminar in Natural Language Processing and Dialogue (2)

Covers advanced topics and current research in natural language processing. Focuses on student presentations and seminar participation. Enrollment is restricted to graduate students. Enrollment is by permission of the instructor. (Formerly CMPS 280Z.)

CSE 285 - Technical Writing for Engineering Graduates (5)

Writing skills development for graduate engineers. Students produce a major writing project with many subtasks. Exercises includes fellowship application; mathematical and algorithmic description; use of tables and graphs; experiment description; and producing technical web sites, presentations, and posters. Enrollment is restricted to graduate students in biomolecular engineering, computer science and engineering, computer science, and electrical and computer engineering and by permission of the instructor. (Formerly CMPE 285.)

CSE 290A - Topics in Algorithms and Complexity Theory: Probabilistic Algorithms and Average Case Analysis (5)

Graduate seminar in algorithms and complexity theory on topics from recently published research journal articles and conference proceedings. Topics vary from year to year depending on the current research of the instructor(s) and interests of students. Students read technical papers from relevant journals and conference proceedings and present class lectures. Guest lectures may supplement the student presentations. A research project and/or paper may be required. (Formerly Computer Science 290A.)

Prerequisite: Enrollment is restricted to graduate students.

CSE 290C - Advanced Topics in Machine Learning (5)

In-depth study of current research topics in machine learning. Topics vary from year to year but include multi-class learning with boosting and SUM algorithms, belief nets, independent component analysis, MCMC sampling, and advanced clustering methods. Students read and present research papers; theoretical homework in addition to a research project. (Formerly Computer Science 290C.)

Prerequisite: Prerequisite(s): CSE 242.

CSE 290D - Neural Computation (5)

An introduction to the design and analysis of neural network algorithms. Concentrates on large artificial neural networks and their applications in pattern recognition, signal processing, and forecasting and control. Topics include Hopfield and Boltzmann machines, perceptions, multilayer feed forward nets, and multilayer recurrent networks. (Formerly Computer Science 290D.)

Prerequisite: Enrollment is restricted to graduate students.

CSE 290E - Object-Oriented Programming Methodology (5)

Object-oriented programming methodology is the application of abstract-data types and polymorphism to coding solution. Topics geared to beginning thesis research in this field. (Formerly Computer Science 290E.)

Prerequisite: Prerequisite(s): CSE 201 and CSE 210A. Enrollment is restricted to graduate students.

CSE 290F - Applications of Combinatorics (5)

Combinatorial mathematics, including summation methods, working with binomial coefficients, combinatorial sequences (Fibonacci, Stirling, Eulerian, Harmonic, Bernoulli numbers), generating functions and their uses, Bernoulli processes, and other topics in discrete probability. Oriented toward problem solving, applications mainly to computer science, but also physics. (Formerly Computer Science 290F.)

Prerequisite: Prerequisite(s): CSE 16 and AM 10. Enrollment is restricted to graduate students and upper-division undergraduates.

CSE 290G - Topics in Software Engineering (5)

Research seminar on current topics in software engineering. Topics vary from year to year depending on the current research of the instructor(s) and interests of students. Students read technical papers from relevant journals and conference proceedings. Synthesis and understanding of materials is demonstrated by a required research project. (Formerly Computer Science 290G.)

Prerequisite: Prerequisite(s): CSE 212A recommended. Enrollment is restricted to graduate students; undergraduates may enroll with permission of instructor.

CSE 290H - Topics in Database Systems (5)

Focuses on current research topics in database systems. Different offerings cover different topics depending on current research of instructor(s) and the interests of students. Students read technical papers from journals and conference proceedings and present class lectures. A research project is required. (Formerly Computer Science 290H.)

Prerequisite: Prerequisite(s): CSE 180 (or equivalent) or CSE 214 or consent of instructor. Enrollment is restricted to graduate students.

CSE 290J - Advanced Topics in Computer Graphics and Visual

Computing (5)

A graduate seminar in computer graphics on topics from recently published research journal articles and conference proceedings. Topics vary from year to year depending on interests of students. Primary areas of interest are likely to be scientific visualization, modeling, rendering, scattered data techniques, wavelets, and color and vision models. Students read technical papers and present class lectures. Guest lecturers supplement the student presentations. A research project is required. (Formerly Computer Science 290B.)

CSE 290K - Advanced Topics in Natural Language Processing (5)

Teaches participants about current methods and directions in active areas of Natural Language Processing research and applications. Students perform independent research and hone skills with state-of-the-art NLP tools and techniques.

Prerequisite: Enrollment is restricted to computer science and engineering, computer engineering, computer science, and technology management graduate students.

CSE 290L - Topics in Crowdsourcing and Collaboration (5)

Explores the foundations of crowdsourcing and computer-mediated collaboration. Covers the algorithmic and statistical foundations of crowdsourcing, introducing and analyzing algorithms, and experimenting with concrete systems. Also, provides an introduction to computational systems for mediating user interaction and collaboration. (Formerly Computer Science 290L.)

Prerequisite: Enrollment is restricted to graduate students.

CSE 290M - Topics in Parallel Computation (5)

Investigates selected topics in applied parallel computation. Topics may include numerical methods, artificial intelligence and machine learning algorithms, graphics and image processing, systolic algorithms, and the interplay between hardware and algorithms. Students are encouraged to investigate and discuss the parallelization of their own research. (Formerly Computer Engineering 290M.)

Prerequisite: Enrollment is restricted to graduate students.

CSE 290N - Topics in Computer Performance (5)

Selected topics of current interest in the area of computer system performance. Subjects may include aspects of large systems, performance, computer networks, storage subsystems, and nontraditional approaches and are subject to periodic revision. (Formerly Computer Engineering 290N.)

Prerequisite: Enrollment is restricted to graduate students.

CSE 290O - Algorithmic Foundations of Convex Optimization (5)

Focuses on some of the foundational aspects of convex and its relationship to modern machine learning. Discusses positive results--how can you solve convex optimization problems--and negative ones with statements like This family of problems is too hard to be solved in reasonable time. Course is divided into

three parts, each exploring a different aspect of convex optimization: 1) algorithmic frameworks; 2) Oracle complexities; 3) the power of randomness. Through this course students are exposed to general concepts of convex geometry, learning theory, and rigorous proofs. (formerly CMPS 290O.)

Prerequisite: Prerequisite(s): CSE 201 and CSE 242.

Enrollment is restricted to computer engineering and computer science graduate students.

CSE 290P - Data Privacy Via Machine Learning, and Back (5)

Helps students achieve both expository knowledge and expertise in the field of data privacy. Focuses on fundamental techniques used in designing privacy-preserving, machine-learning systems in both academia and in the industry. Students are expected to read and understand recent research papers in the topic. (Formerly Computer Science 290P.)

Prerequisite: Prerequisite(s): CSE 201 and CSE 242 or equivalent. Enrollment is restricted to graduate students.

CSE 290Q - Topics in Programming Languages (5)

Current research topics on computer programming languages. Topics vary year to year. Students read papers from current conferences and journals, and present class lectures. A research project is required. (Formerly Computer Science 290Q.)

Prerequisite: Prerequisite(s): CSE 210A. Enrollment is restricted to graduate students.

CSE 290S - Advanced Topics in Computer Systems (5)

Focuses on current research topics in computer systems. Topics vary from year to year depending on the current research of the instructor(s) and the interests of the students. Students read technical papers from current journals and conference proceedings, and present class lectures. A research project is required. (Formerly Computer Science 290S.)

Prerequisite: Prerequisite(s): CSE 231 recommended. Enrollment is restricted to graduate students; qualified undergraduates may enroll with instructor's consent.

CSE 290T - Topics in Computing for Society (5)

Current research topics on computer technology that is intentionally targeted to benefiting society. Topics vary year to year. Students read papers from current conferences and journals, and present class lectures. A research project is required. (Formerly Computer Science 290T.)

Prerequisite: Enrollment is restricted to graduate students.

CSE 290X - Cryptography and Computer Security (5)

Research seminar on encryption and related technologies. Topics include theory of codes, random sequences and generators, public key cryptosystems, private key cyphers, key exchange protocols, quantum computing and cryptography. Major project required. Prerequisite: interview with instructor. (Formerly Computer Science 290X.)

CSE 293 - Advanced Topics in Computer Science & Engineering

(5)

A graduate seminar on a research topic in computer engineering which varies according to instructor. Possible topics include, but are not limited to, communication networks, data compression, special-purpose architectures, computer arithmetic, software reliability and reusability, systolic arrays. (Formerly Computer Engineering 293.)

CSE 296 - Masters Project (2)

Independent completion of a masters project under faculty supervision. Students submit petition to sponsoring agency.

CSE 297A - Individual Study or Research (5)

Independent study or research under faculty supervision. Although this course may be repeated for credit, not every degree program will accept a repeated course towards degree requirements. Students submit petition to sponsoring agency.

CSE 297B - Individual Study or Research (10)

Independent study or research under faculty supervision. Although this course may be repeated for credit, not every degree program will accept a repeated course towards degree requirements. Students submit petition to sponsoring agency.

CSE 297C - Individual Study or Research (15)

Independent study or research under faculty supervision. Although this course may be repeated for credit, not every degree program will accept a repeated course towards degree requirements. Students submit petition to sponsoring agency.

CSE 297F - Independent Study or Research (2)

Independent study or research under faculty supervision. Although this course may be repeated for credit, not every degree program will accept a repeated course toward degree requirements.

CSE 299A - Thesis Research (5)

Thesis research conducted under faculty supervision. Although the course may be repeated for credit, not every degree program will accept a repeated course towards degree requirements. Students submit petition to sponsoring agency.

CSE 299B - Thesis Research (10)

Thesis research conducted under faculty supervision. Although the course may be repeated for credit, not every degree program will accept a repeated course towards degree requirements. Students submit petition to sponsoring agency.

CSE 299C - Thesis Research (15)

Thesis research conducted under faculty supervision. Although the course may be repeated for credit, not every degree program will accept a repeated course towards degree requirements. Students submit petition to sponsoring agency.

CSE 299F - Thesis Research (2)

Independent study or research under faculty supervision. Enrollment is restricted to graduate students. Recommended for

part-time students. Students submit petition to sponsoring agency.

CSP - COASTAL SCIENCE AND POLICY

Graduate

CSP 200 - Natural Sciences for Coastal Sustainability (5)

Provides a basic foundation in the natural sciences including the environment (atmosphere, land, water, sea), species populations, ecosystems and biodiversity, and their relevance to sustainability issues of the coastal zone.

Prerequisite: Prerequisite(s): concurrent enrollment in CSP 210 and CSP 220. Enrollment is restricted to graduate students in the coastal science and policy program, or by permission of the instructor.

CSP 210 - Social Sciences for Coastal Sustainability (5)

Provides a basic foundation in the social sciences, through systematic study of communities, institutions, and entire societies. Examines the relevance of sociological theory, social interactions and relationships, social inequality, and social change to sustainability issues of the coastal zone.

Prerequisite: Prerequisite(s): concurrent enrollment in CSP 200 and CSP 220. Enrollment is restricted to graduate students in the coastal science and policy program, or by permission of the instructor.

CSP 220 - Economics for Coastal Sustainability (5)

Builds a foundation of economic concepts pertaining to the environment and explores tools for environmental valuation. Investigates the role for government action related to the environment, including estimation of costs and benefits for regulations and related policies.

Prerequisite: Prerequisite(s): concurrent enrollment in CSP 200 and CSP 210. Enrollment is restricted to graduate students in the coastal science and policy program, or by permission of the instructor.

CSP 230 - Integrated Problem-Based Discussion (0)

Focusing on a series of case studies, this discussion section demonstrates means and values of integrating across the natural and social sciences and economics disciplines in developing solutions to coastal sustainability.

Prerequisite: Prerequisite(s): Concurrent enrollment in CSP 200, CSP 210, and CSP 220. Enrollment restricted to coastal science and policy graduate students.

CSP 231A - CSP Year 1 Capstone Planning & Design Fall (2)

Students learn and apply methods for designing scalable solutions to complex problems, focusing on sustainability challenges and opportunities in coastal areas. Sessions primarily involve peer-review and feedback on student progress in planning their individual Coastal Science and Policy (CSP)

capstone project. The capstone project must engage with a real-world partner(s) on a scalable opportunity for solving a critical problem in coastal areas (from land to sea). Faculty lead mini-lectures as needed. Course stresses learning-by-doing: weekly assignments have students work outside of class on steps or skills in the design process and then the student shares their work in the following class to gain peer insights. Students should expect to do the reading and a substantial assignment each week BEFORE the class session meets.

Prerequisite: Enrollment restricted to Coastal Science and Policy M.S. students; and to Ph.D. students who have declared the Coastal Science and Policy Designated Emphasis by permission.

CSP 231B - CSP Year 1 Capstone Planning & Design Winter (2)

Picks up where the fall capstone planning seminar ended. Students continue designing capstone project for pursuing a scalable solution to a complex and pressing coastal sustainability problem. Winter focus is learning and applying strategies and methods to: (a) co-create a capstone project with a non-academic partner in the government, non-governmental or private sector; and (b) develop and submit successful funding proposals for the project. Methods learned apply broadly to collaborative, solutions-oriented work that may be pursued after graduation. Weekly assignments mean working outside of class on steps or skills for co-creating and fundraising with partners and then sharing work for peer-review in class in the next week. Expect to do the reading and weekly assignments before each week's seminar session. Instructor provides separate instructions for weekly assignments.

Prerequisite: Enrollment restricted to Coastal Science and Policy M.S. students; and to Ph.D. students who have declared the Coastal Science and Policy Designated Emphasis by permission.

CSP 244 - Adaptation and Planning (5)

Introduces students to conceptual frameworks for developing solutions to coastal sustainability problems, and drawing on knowledge and skills gained in previous coastal science and policy courses to perform an integrated assessment of a coastal sustainability problem.

Prerequisite: Enrollment restricted to coastal science and policy graduate students.

CSP 281A - Hacking for Oceans—Lean Design Methods (5)

One-quarter graduate-level class in which multidisciplinary student teams of four address problem or challenges provided by real-world sponsors or identified by student groups. Teams learn how to apply the Lean Launchpad and Lean Startup methodologies to discover and validate customer needs and to continually build prototypes to test whether they understood the problem and solution. Weekly assignments involve working outside of class on steps or skills in the design process and then sharing it for peer-review in class. Involves reading and a substantial assignment each week before the next week's session on that topic. Course is held concurrently with an undergraduate course. Graduate students are required to submit an additional culminating report such as a funding proposal to

support next steps in their team's solution, a critical analysis of the Lean Design Method, or a policy analysis regarding scalable adoption of the solution. Enrollment is by instructor consent. Application and interview in winter quarter for spring quarter course is required.

CSP 290A - Coastal Science and Policy Capstone Project (10)

First of three independent research courses during which students work closely with partner institutions and faculty co-mentors to generate alternative, interdisciplinary-based solutions to coastal sustainability problems. Provides experience in a real-world, collaborative, problem-solving environment.

Prerequisite: Prerequisite(s): Concurrent enrollment in CSP 291. Enrollment restricted to coastal science and policy graduate students.

CSP 290B - Coastal Science and Policy Capstone Project (10)

Second of three independent research courses during which students work closely with partner institutions and faculty co-mentors to generate alternative, interdisciplinary-based solutions to coastal sustainability problems. Provides experience in a real-world, collaborative, problem-solving environment.

Prerequisite: Prerequisite(s): Concurrent enrollment in CSP 291. Enrollment restricted to coastal science and policy graduate students.

CSP 290C - Coastal Science and Policy Capstone Project (10)

Third of three independent research courses during which students work closely with partner institutions and faculty co-mentors to generate alternative, interdisciplinary-based solutions to coastal sustainability problems. Provides experience in a real-world, collaborative, problem-solving environment.

Prerequisite: Prerequisite(s): Concurrent enrollment in CSP 291. Enrollment restricted to coastal science and policy graduate students.

CSP 291 - Coastal Science and Policy Capstone Seminar (2)

Concurrent with year-long capstone project. Students share the background, challenges and successes they experience in their capstone projects. Provides students with a broader exposure to real-world, collaborative, problem-solving of coastal sustainability issues.

Prerequisite: Corequisite(s): CSP 290A, CSP 290B, or CSP 290C. Enrollment is restricted to coastal science and policy graduate students.

CSP 292 - Special Topics in Coastal Science and Policy (2)

Seminar in which students present, discuss, and gain feedback on a current special topic in the interdisciplinary arena of coastal science and policy. The special topic can involve identification of current problems, relevant research and practice, and/or design of solutions in coastal science and policy.

Prerequisite: Enrollment is restricted to graduate students.

CSP 297 - Independent Study in Coastal Science and Policy (5)

Independent study and research under faculty supervision. The student, guided by a faculty member, pursues in-depth learning about a specific coastal science and policy problem, opportunity or solution. Students submit petition to sponsoring agency. Enrollment is restricted to graduate students.

DANM - DIGITAL ARTS AND NEW MEDIA

Upper-Division

DANM 130 - Embodiment in New Media Art (5)

Engages the topic of embodiment within new media art theory and practice. Focus is on embodiment within performance, time-based, electronic, and new media arts practice. Students produce a final paper and artistic project on the topic. Lower-division undergraduates may enroll with permission of instructor.

Prerequisite: Enrollment restricted to juniors and seniors.

DANM 132 - Literary Games: The Intersection of Writing and Play (5)

Hands-on course surveying the thriving micro-genres in the neutral zone between games and literature. Students read, play, and author stories that couldn't exist on a printed page. Interactive fiction, algorithmic poetry, and brand-new experiments.

DANM 133 - Introduction to Electronics and Physical Computing (5)

Introduces electronics using the open-source Arduino platform. Learn how to build interactive circuits through hands-on tutorials. In a workshop environment, students acquire the technical skills required to create electronic artwork. No previous experience required.

DANM 134 - Hacking for Artists: Experimenting with Digital Media (5)

Hacking is the modification, reconfiguration, and reuse of computer code or hardware to create new functionality. Course encourages a hands-on approach to digital-media creation including the basics of computer programming and hacking techniques. No programming experience required.

DANM 135 - Kinematics: Motion and Machine Art (5)

Explores the history of machines. Kinetic art is presented including: animatronic puppetry, balance mobiles, light compositions, logic and mechanical art, interactive sculpture, and resonance cymatics. Students utilize automation techniques to create art projects using a modular set of gears, linkages, cams, belts, and springs. Discussion of technological advances in the field of kinetic art and its impact on society.

DANM 136 - Mapmaking for Environmental Activism (5)

Introduces the basic principles of geographic analysis and visual communication through mapmaking. Projects focus on environmental issues, and class discusses best practices for distributing information and communicating ideas.

DANM 138 - Procession: Where Sculpture Meets Costumes Meets Performance (5)

Teaches techniques to animate sculptures, such as wearables/body art, mobility, puppetry, sound, light, or projection. Covers building techniques and how to incorporate individual creativity in a collaborative setting to create a common theme for the procession.

DANM 140 - Introduction to 3D Printing, Laser Cutting, and More (5)

Learn to design functional objects, sculpture, and other digitally inspired forms in a variety of 3-D applications (Cinema 4-D, Maya, AutoCad, Rhino, SketchUp), then produce those models as physical objects with a variety of rapid prototyping methods including additive 3-D printing, CNC milling, vacuum forming, and laser cutting.

DANM 141 - Introduction to Soft Interaction: Fiber Arts and Reactive Technologies (5)

Students learn to create interactive artwork through the combination of fiber arts and reactive technology. Course explores electronic art that is worn or touched, and discovers new developments in eTextiles that allow for this interaction.

DANM 143 - Projects in Ecological Art (5)

By investigating topics related to water in California, students produce works of digital and new media art that engage with environmental issues and the local community.

DANM 199 - Tutorial (5)

Independent digital arts and new media research project under the guidance of a digital arts and new media faculty member or other faculty. Students submit petition to sponsoring agency. Enrollment restricted to juniors and seniors.

DANM 199F - Tutorial (2)

Independent digital arts and new media research project under the guidance of a digital arts and new media faculty member or other faculty. Students submit petition to sponsoring agency.

Graduate

DANM 201 - Recent Methods and Approaches to Digital Arts and Culture (5)

Students examine methods and approaches to research and writing in digital art and new media, while exploring key theories concerning technology, art, and culture. Focus is on the interaction between digital technologies and socio/cultural formations.

Prerequisite: Enrollment is restricted to graduate students.

DANM 202 - Dialogues and Questions in Digital Arts and Culture (5)

Students engage in dialogues at the intersection of theory and practice with the goal of producing a pre-thesis proposal and essay. Readings and seminar discussions inform the development of project proposals and essays, which theoretically contextualize students' work.

Prerequisite: Enrollment is restricted to graduate students.

DANM 203 - Professional Development for the Arts (5)

A professional art practices practicum that focuses on researching opportunities and developing practical strategies and skills to ensure success outside an academic environment.

Prerequisite: Enrollment is restricted to graduate students.

DANM 210 - Project Design Studio (5)

Students work on the design of individual projects by developing project proposals, budgets, proof of concept design documents and/or prototypes and exploring tools, technologies, programming languages, hardware, software, and electronics techniques relevant to their projects.

Prerequisite: Enrollment is restricted to graduate students.

DANM 211 - Critique (5)

First-year digital arts and new media graduate students are required to present work-in-progress based on the projects developed in earlier courses and during the current quarter in individual studio critiques with the instructor as well as in group critiques.

Prerequisite: Enrollment is restricted to graduate students.

DANM 212 - Thesis Proposal (0)

First-year digital art and new media graduate students work on the development and completion of their thesis-project proposal and abstract under the supervision of the program chair and their thesis committees.

Prerequisite: Enrollment is restricted to DANM students.

DANM 215 - MFA Exhibition Production (5)

Second-year digital arts and new media graduate students work with faculty curator/coordinator to develop thesis projects specifically for the group exhibition context. Students contribute to exhibition design and collateral materials while studying the unique presentation and curatorial challenges of new media.

Prerequisite: Enrollment is restricted to graduate students.

DANM 216 - Digital Bodies (5)

Explores the appearance, form, and theoretical status of the human body/political subject in online art. Focuses on representations of race and gender, family resemblances, and local communities, as well as the political and colonial metaphors of spatial interaction operating on the World Wide Web. Visual representations of bodies that take the form of

avatars, advertising, robots, and anime studied in their contextual usage.

Prerequisite: Enrollment is restricted to graduate students. Upper-division undergraduates may enroll with permission of instructor.

DANM 219 - Introduction to Electronics for Artmaking (5)

Intensive introduction to electronic devices used in artmaking, providing hands-on experience with sensors, motors, switches, gears, lights, simple circuits, microprocessors, and hardware storage devices to create kinetic and interactive works of art. Students are billed a materials fee.

Prerequisite: Enrollment is restricted to graduate students.

DANM 220 - Introduction to Programming for the Arts (5)

Covers aspects of computer programming necessary for digital art projects. Students learn to manipulate digital media using program control for installations, presentations, and the Internet. No prior programming experience required.

Prerequisite: Enrollment is restricted to graduate students.

DANM 221 - Mathematics and the Arts (5)

Examines the role of mathematics in the arts since the computer revolution with an emphasis on chaos, fractals, and symmetry. Covers abstract animation and algorithmic music, including the history of leading innovators and techniques from 1950 to the present. Student projects explore the creative process today using cutting-edge technologies.

Prerequisite: Enrollment is restricted to graduate students. Upper-division undergraduates may enroll with permission of instructor.

DANM 227 - Projected Light in Performance (5)

Exploration of projected light in performance and art. The history of lighting as art is covered in a hands-on demystifying format from the shadow of a bare light bulb to the latest in automated and projection equipment and techniques.

Prerequisite: Enrollment is restricted to graduate students. Juniors and seniors may enroll with permission of instructor.

DANM 233 - The Object as Interface (5)

Combination theory and studio-based exploration into the role of the object in real and virtual space. Provides a broad conceptual and theoretical examination of issues relating to object-making on a physical and dematerialized plane.

Prerequisite: Enrollment is restricted to graduate students.

DANM 241B - Modern Art: Cubism to Pop (5)

A history of the visual arts from the 1910s to the 1960s beginning in Europe and moving to the United States. Follows key movements of modern art while emphasizing the social, political, and philosophical events that inform it. Students cannot receive credit for this course and HAVC 141B.

Prerequisite: Enrollment is restricted to graduate students in digital arts new media, film, music, social documentation, theater, or visual studies.

DANM 250A - Collaborative Research Project Group: Art and Science (5)

Three-quarter, collaborative-research, project group encompasses a range of faculty-initiated projects that investigate new methods in art and science collaboration to solve real-world problems and produce outcomes of substantial artistic and scientific value.

Prerequisite: Enrollment is restricted to graduate students.

DANM 250B - Collaborative Research Project Group: Socially Engaged Art (5)

Three-quarter, collaborative-research, project group encompasses a range of faculty-initiated projects that join digital methods with community-media activism to facilitate a culture of participation and social engagement.

Prerequisite: Enrollment is restricted to graduate students.

DANM 250C - Collaborative Research Project Group: Performance and Embodiment (5)

Three-quarter, collaborative-research, project group encompasses a range of faculty-initiated projects that investigate performance and embodied experience as profound sources of understanding and communication, pushing the limits of human identity, affect, empathy, and expression.

Prerequisite: Enrollment is restricted to graduate students.

DANM 250E - Collaborative Research Project Group: Experimental Play (5)

Three-quarter, collaborative-research, project group encompasses a range of faculty-initiated projects that investigate computer games and related forms to engage audiences, make arguments, tell stories, and shape social space through creation of new games and through reading and playing related works.

Prerequisite: Enrollment is restricted to graduate students.

DANM 250F - Research Group: Isaac Julien Studio Lab (5)

Research group encompasses a range of faculty-initiated projects that investigate moving and still images to create visual and sonic languages for production, exhibition and installation.

Prerequisite: Enrollment is restricted to graduate students.

DANM 250G - Research Group: Isaac Julien Studio Lab - London Quarter (15)

Research group course focusing on research and production of Isaac Julien's and Mark Nash's moving image and curatorial projects. Course takes place in the Isaac Julien Studio in London. Students encouraged to develop and prototype their own projects and thesis work. Course includes case studies, workshops, guest speakers, seminar discussions, and site visits. Outside of class students work on independent projects, as well

as projects in the Isaac Julien Lab alongside staff. Enrollment is by instructor permission and open to DANM graduate students and graduate and Ph.D. students in other project groups or programs upon application.

DANM 254I - Empirical Approaches to Art Information (5)

Reading and practice in empirical methods, as applied to the study of music, visual art, multimedia production, and performance arts. Topics include semiotics, critiques of empiricism, cultural determinants and contingents of perception, the psychophysics of information, sensory perception (visual and auditory), memory, pattern recognition, and awareness. Students apply existing knowledge in the cognitive sciences to a developing creative project, or develop and conduct new experiments.

Prerequisite: Enrollment is restricted to graduate students.

DANM 280 - Seminar in Digital Arts and New Media (2)

Weekly seminar covering topics of current research in digital arts and new media. Focuses on student presentations and seminar participation.

Prerequisite: Enrollment is restricted to graduate students.

DANM 281 - Special Topics in Digital Arts and New Media (5)

This hybrid theory/practice course examines the social implications of emerging technologies and cultural practices, with a focus on how artists and other producers engage with them in a critical manner that reveals their inner logics and/or deploys them for alternative purposes.

Prerequisite: Enrollment is restricted to graduate students; juniors and seniors may enroll by permission of the instructor.

DANM 297 - Independent Study (5)

Independent digital arts and new media research project under the guidance of a digital arts and new media faculty member or other faculty with approval of adviser. Project includes readings, research, and a written report. Students submit petition to sponsoring agency. Enrollment is restricted to graduate students. Maximum 10 credits.

DANM 297G - Independent Study (3)

Independent digital arts and new media research project under the guidance of a digital arts and new media faculty member or other faculty with approval of adviser. Students submit petition to sponsoring agency. Enrollment is restricted to graduate students. May be repeated for a maximum 6 credits.

DANM 299 - Thesis Research (5)

Students carry out a master's of fine arts thesis in digital arts and new media research, under the guidance of a thesis committee. The thesis will be an arts project with digital documentation accompanied by a written paper discussing the student's preparatory research as well as the theoretical significance of the project. Enrollment is restricted to graduate students. Maximum 10 credits.

EART - EARTH SCIENCES

Lower-Division

EART 1 - Oceanography (5)

An introduction to the physical environment of the ocean. Origin and evolution of ocean basins; sea-floor morphology; origin, distribution, historical record, and economic significance of marine sediments; ocean currents, waves, tides, and changing sea level; beaches, shorelines, and coastal processes; marine resources, pollution, and human impacts on the oceans. Students may also enroll in and receive credit for OCEA 1.

EART 2 - Earth Catastrophes (5)

The role of catastrophic processes in shaping Earth and the environment in which we live. The physical processes causing earthquakes, volcanic eruptions, tsunamis, floods, windstorms, landslides, and meteorite impacts will be described, along with the role played by these rapid processes in the geological and biological evolution of the planet. Interdisciplinary approaches to understanding these phenomena will be discussed. The entire time scale from formation of the universe to the present Earth system will be considered.

EART 3 - Geology of National Parks (5)

Geologic concepts and processes responsible for shaping our national parks including mountain building, volcanic and earthquake activity, sedimentation, weathering, erosion, and glaciation. An understanding of how geology impacts our lives is emphasized. Appropriate for both science and non-science majors who wish to enhance their knowledge, enjoyment, and appreciation of our national parks.

EART 5 - California Geology (5)

An introduction to physical geology emphasizing the minerals, rocks, volcanoes, mountains, faults, and earthquakes of California. In-class field trips to study the caves, rocks, and landforms of the campus and the Monterey Bay area. Discussion-1 hour. Concurrent enrollment in EART 5L is required for majors and minors.

EART 5L - California Geology Laboratory (1)

Laboratory sequence illustrating topics covered in course 5 with particular emphasis on rock and mineral identification and map interpretation. Field trip. Laboratory three hours.

EART 7 - The History of Life (5)

An examination of the major events in the history of life, from the origin of life approximately four billion years ago, to the wave of extinctions that has decimated plants and animals around the globe over the past 30,000 years.

EART 8 - Planetary Discovery (5)

A sweeping tour of planets, satellites, and small bodies in and out of the solar system. Focuses on major scientific results from telescopes and spacecraft missions. Topics include planetary system architecture, planetary atmosphere, surface and interior,

planetary formation and evolution, astrobiology, extra-solar planets. Open to all students.

EART 10 - Geologic Principles (5)

Introduction to the scientific study of Earth, the materials composing it, and the processes shaping it. Topics include minerals and rocks, Earth's internal structure, plate tectonics, earthquakes and volcanoes, oceans and the atmosphere, the formation of landscapes and global change. A one-day, optional field trip is included. Concurrent enrollment in EART 10L is required for majors and minors.

EART 10L - Geologic Principles Laboratory (1)

Laboratory sequence illustrating topics covered in course 10, with particular emphasis on rock and mineral identification and map interpretation. Laboratory 3 hours. In-lab field trips.

EART 11 - Earthquakes (5)

Causes and effects of earthquakes. How do we measure, mitigate, and try to predict earthquakes? Plate motion, frictional faulting, earthquake triggering, wave propagation, earthquake damage, related hazards, and other social effects. Hazard reduction through earthquake forecasting and earthquake-resistant design. Class includes one full day weekend field trip to local faults. Advanced algebra and high school geometry recommended.

EART 12 - Introduction to Weather and Climate (5)

Many meteorological phenomena are familiar to us: clouds, fog, rain, snow, wind, lightning, and severe storms. Climate is the sum of weather over long periods and is changing (e.g., greenhouse warming, ozone depletion, urban smog) due to mankind's activities. Conceptual understanding of how and why the present-day atmosphere behaves as it does and how this may change in the future is the primary goal of this course.

EART 20 - Environmental Geology (5)

Introduction to aspects of geology which affect and are affected by humans. Addresses a broad range of topics including resource management, geologic hazards, air and water issues, population and land use, energy costs and effectiveness, and global change, all from a unique geological/environmental perspective. Lectures include strategies for mitigating these issues. Includes a one-day field trip. Concurrent enrollment in 20L required for majors and minors.

EART 20L - Environmental Geology Laboratory (1)

Laboratory sequence illustrating topics covered in course 20, with emphasis on rock and mineral identification, geologic hazard assessment, geologic resource management, and land use planning. In-lab field trip. Laboratory 3 hours.

EART 30 - Water in the Environment (5)

Broadly explores how components of the water cycle (precipitation, evapotranspiration, streamflow, groundwater) influence the structure of different environments as well as the communities, cultures, and people within these environments.

EART 32 - The Science of Cooking (5)

Investigates principles of physics and chemistry as they apply to cooking. Students cook different dishes weekly to both illustrate these principles and to understand how ingredients, technique, and science intersect to make the food that is eaten all around the world. By the end of the course, students will have made recipes that represent a diversity of global cooking traditions. Access to a kitchen and basic cooking equipment is required, and rudimentary cooking skills and kitchen safety knowledge are assumed.

EART 66 - Natural History of Dinosaurs (5)

Explores the origin, evolution, and extinction of dinosaurs with emphasis on paleobiology and paleoecology. Covers fundamental paleontological and evolutionary principles, dinosaur anatomy and behavior, the hot-blooded/cold-blooded debate, dinosaur-bird relationships, diversity, and exploits of the great dinosaur hunters. One and a half hour of discussion each week. (Formerly EART 65.)

EART 96 - Earth Sciences Orientation (2)

Practical, evidence-based strategies for maximizing learning, developing a sense of belonging, and building your identity in Earth and planetary sciences studies. This course can be taken for Pass/No Pass grading only. (Formerly Academic Success Skills.)

Prerequisite: Enrollment is restricted to first-year proposed Earth sciences majors.

EART 98 - Earth Sciences Internship (5)

A supervised learning experience involving practical application of lower division Earth sciences knowledge while working with approved companies, governmental agencies, or research organizations. Students consult weekly with supervising faculty and prepare a final report of their work, to be evaluated both by the sponsoring agency and the faculty supervisor. Consult sponsoring agency for enrollment criteria; after instruction on resume preparation and interview skills, student must interview and be selected for internship by approved sponsoring organizations.

EART 99 - Tutorial (5)

Students submit petition to sponsoring agency.

Upper-Division**EART 100 - Vertebrate Paleontology (5)**

Introduction to vertebrate history, with an emphasis on vertebrate relationships and the co-evolution of organisms and environments. Specific topics include vertebrate origins, systematics and classification, adaptive revolutions, mass extinctions, and the rise and fall of dinosaurs.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements and EART 5 or EART 10 or EART 20 or BIOE 20C, or ANTH 1. Concurrent enrollment in EART 100L is required.

EART 100L - Vertebrate Paleontology Laboratory (2)

Comparative anatomy and functional morphology of vertebrates, and preservation of vertebrate hard parts, using modern and fossil specimens. Laboratory three hours and one 1-day field trip.

Prerequisite: Concurrent enrollment in EART 100 is required.

EART 101 - Invertebrate Paleobiology (5)

An introduction to paleobiology; the use of fossil evidence to pose and solve evolutionary and geologic questions.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements and EART 5 or EART 10 or EART 20 or BIOE 20C or ANTH 1. Concurrent enrollment in EART 101L is required.

EART 101L - Invertebrate Paleobiology Laboratory (1)

Systematics, ecology, and evolutionary history of the major groups of fossil-forming animals. Laboratory 3 hours and one 1-day field trip.

Prerequisite: Concurrent enrollment in EART 101 is required.

EART 102 - Marine Geology (5)

Geology of the marine environment. Topics include controls on the types, origin, and distribution of marine sediments; geology of oceanic crust; evolution of continental margins and plate boundaries; introduction to paleoceanography. Discussion: 1 hour. Students cannot receive credit for this course and OCEA 280.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, and EART 5 or EART 10 or EART 20 or BIOE 20C.

EART 104 - Geologic Hazards (5)

The recognition, evaluation, and mitigation of geologic hazards: earthquakes and faulting, tsunamis, volcanism, landslides and mass movements, and flooding.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, and EART 10 and EART 10L; or EART 5 and EART 5L; or EART 20 and EART 20L.

EART 105 - Coastal Geology (5)

An investigation of the evolution, morphology, and processes in the coastal zone including the terrestrial (marine terraces, dunes, estuaries, sea cliffs) and marine (beaches, continental shelves, sea level changes, shoreline erosion and protection, waves, tides) components and their interaction. Laboratory: 3 hours.

Prerequisite: Prerequisite(s): EART 5 or EART 10 or EART 20.

EART 106 - Coasts in Crisis (5)

Comprehensive assessment of the impacts that the human population is having on the coastal zone globally and the

diverse ways in which geologic processes and coastal hazards impact human settlement and development in the coastal zone.

EART 107 - Remote Sensing of the Environment (5)

Introduction to geographic information systems (GIS) and remote sensing (RS) as valuable tools in the study of geology. Covers application of GIS/RS to study of surface processes, including landslides, hydrologic basins, coastal erosion, modern floods, volcanic activity and surface deformation.

Prerequisite: Prerequisite(s): EART 5 or EART 10 or EART 20.

EART 109 - Elements of Field Geology (5)

Basic tools and techniques used in geologic fieldwork. Preparation, analysis, and interpretation of geologic maps. Nine to 10 days of weekend field trips required, including a six-day geologic mapping exercise. Laboratory: 3 hours. Recommended for courses EART 120, EART 130, EART 150, and required for EART188A-EART 188B. May not be taken concurrently with EART 120, EART 150, or EART 188.

Prerequisite: Prerequisite(s): Satisfaction of the Entry Level Writing and Composition requirements, and EART 5 or EART 10 or EART 20; and EART 5L or EART 10L or EART 20L; or by permission of instructor. Concurrent enrollment in EART 109L is required. Enrollment is restricted to majors and minors in Earth and planetary sciences and the combined majors with anthropology and environmental studies.

EART 109L - Field Geology Laboratory (2)

Laboratory exercises essential to the successful completion of fieldwork required in course 109. Topics include topographic maps, Brunton compass, rock identification and description, geologic map analysis, structure section construction, and landslide recognition.

Prerequisite: Concurrent enrollment in EART 109 is required. Enrollment is restricted to Earth sciences majors and minors and the combined majors with anthropology and environmental studies or by permission of instructor.

EART 110A - Evolution of the Earth (5)

Investigation of the processes and mechanisms that have produced the present Earth system, with an emphasis on the temporal evolution of the earth from the Archean to the present. Specific topics covered include cyclicity in Earth processes and the evolution of, and interplay between the planet's crust, atmosphere, hydrosphere, and biosphere.

Prerequisite: Prerequisite(s): EART 5 or EART 10 or EART 20, and EART 5L or EART 10L or EART 20L, and MATH 11A or MATH 19A or AM 15A.

EART 110B - Earth as a Chemical System (5)

The chemical properties of Earth materials and the chemical processes by which the planet has evolved to its present state. Specific topics covered include properties of minerals; the genesis of igneous, metamorphic, and sedimentary rocks; and the linkage between the solid Earth and the hydrosphere. Enrollment is permitted by permission code with equivalent or

exceptional background, or if enrolled concurrently in CHEM 1B.

Prerequisite: Prerequisite(s): EART 5 or EART 10 or EART 20, and EART 5L or EART 10L or EART 20L, and CHEM 1B.

EART 110C - The Dynamic Earth (5)

Physical processes occurring in the interior of the earth, at its surface and in the oceans and atmospheres including plate tectonics, structural deformation of rocks, and material and heat transport.

Prerequisite: Prerequisite(s): EART 5 or EART 10 or EART 20, and EART 5L or EART 10L or EART 20L; and MATH 11A or MATH 19A; and PHYS 6A or PHYS 5A.

EART 110L - Evolution of the Earth Laboratory (2)

Laboratory sequence illustrating topics covered in EART 110A. Emphasis is on quantifying and evaluating different phenomena related to thermal, tectonic, climatic, and evolutionary processes.

Prerequisite: Prerequisite(s): concurrent enrollment in EART 110A.

EART 110M - Earth as a Chemical System Laboratory (2)

Laboratory sequence illustrating topics covered in course 110B. Emphasizes identification of the major rock-forming minerals and common rock types; principles of basic crystallography.

Prerequisite: Prerequisite(s): concurrent enrollment in EART 110B.

EART 110N - The Dynamic Earth Laboratory (2)

Laboratory sequence illustrating topics covered in course 110C.

Prerequisite: Prerequisite(s): concurrent enrollment in EART 110C.

EART 111 - Mathematics in the Earth Sciences (5)

Series and sequences, vectors, 3D analytic geometry, partial differentiation, matrix algebra, and differential equations with applications in the Earth sciences. Topics include matrix manipulation, systems of linear equations, least-squares, Taylor series, gradients, optimization, analytic and numerical solutions to differential equations.

Prerequisite: Prerequisite(s): EART 5 or EART 10 or EART 20, and MATH 11B or MATH 19B or AM 15B.

EART 112 - Geophysical Data Science (5)

Introduction to coding through fitting and modelling data. General linear models and spectral analysis introduced with applications to environmental and geophysical data. Introduction to MATLAB included.

Prerequisite: Prerequisite(s): MATH 21 or AM 10; plus one of the following series: MATH 19A and MATH 19B (strongly preferred); or MATH 11A and MATH 11B; or AM 15A and AM 15B.

EART 116 - Hydrology (5)

Introduces processes involving water on and near Earth's surface, including meteorology, water properties, surface flows in streams and runoff, flood analysis, ground water, water budgets, sediment transport, erosion, and water quality. Problem set and laboratory each week. Laboratory/field: 3 hours. Alternates annually with EART 146.

Prerequisite: Prerequisite(s): EART 5 or EART 10 or EART 20; and MATH 11A or MATH 19A or AM 15A; and PHYS 6A and PHYS 6L or PHYS 5A and PHYS 5L, or by permission of the instructor. EART 5L or EART 10L or EART 20L and PHYS 6B and PHYS 6M are recommended.

EART 118 - Seismotectonics (5)

Earthquakes and their relationship to plate tectonics. Topics include seismological analysis of earthquake faulting, types of seismic waves, seismicity distributions, thermal and rheological structure of plates, and seismic investigation of plate dynamics.

Prerequisite: Prerequisite(s): EART 5 or EART 10 or EART 20; and MATH 11B or MATH 19B; and PHYS 5A or PHYS 6A.

EART 119A - Introduction to Scientific Programming (5)

Introduction to programming for Earth and environmental scientists. Course assumes no prior programming experience. Develops useful Python skills for prospective scientists, rather than cover all aspects of the computer language. (Formerly EART 119.)

Prerequisite: Prerequisite(s): MATH 19A or MATH 11A or MATH 20A and EART 5 or EART 10 or EART 20.

EART 119B - Advanced Scientific Programming (5)

Advanced programming course designed to cover the basic software design workflow in the context of scientific computing, including specific topics such as using Linux, cloud computing, version control, numerical simulation, computer vision, and machine learning. Learners should bring basic Python experience (e.g., prerequisite EART 119A) or significant programming experience in another language. The final project has learners collaborate on developing a scientific computing project, collaboratively implement the project with git version control and then deploy the repository for computation on the UCSC Hummingbird cluster or in the cloud. Taught in conjunction with EART 219. Students cannot receive credit for this course and EART 219.

Prerequisite: Prerequisite(s): EART 119A or other programming experience by instructor permission. Enrollment is restricted to sophomores, juniors, and seniors.

EART 120 - Sedimentology and Stratigraphy (5)

Stratigraphic principles used in classifying sedimentary rocks. Fundamentals of sedimentary mechanics. Analysis and interpretation of facies and depositional systems. Introduction to seismic facies and basin analysis. Course includes three Sunday field exercises.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, and EART 110A. EART 110B is recommended as preparation. May not be taken concurrently with EART 109.

EART 120L - Sedimentology and Stratigraphy Laboratory (2)

Laboratory sequence illustrating topics in course 120, including sedimentary petrology, sedimentary structures, sequence stratigraphy, and geohistory analysis.

Prerequisite: Prerequisite(s): concurrent enrollment in EART 120.

EART 121 - The Atmosphere (5)

Course focuses on understanding basic atmospheric weather and climate phenomena starting from the fundamentals of physics and chemistry. Using this approach, covers topics such as atmospheric circulation, precipitation, clouds, storms, urban and regional air quality, atmospheric aerosols, and climate and global change.

Prerequisite: Prerequisite(s): MATH 11B or MATH 19B or AM 15B; and CHEM 1A; and PHYS 5B or PHYS 6B.

EART 124 - Modeling Earth's Climate (5)

A hands-on course in climate modeling with emphasis on computer programming (Python) exercises. Topics include the physical laws governing climate, the hierarchy of model complexity, parameterizations, using models for prediction versus understanding, and application to past and future Earth climates.

Prerequisite: Prerequisite(s): MATH 11B or MATH 19B and PHYS 6B or PHYS 5B.

EART 125 - Statistics and Data Analysis in the Geosciences (5)

Project-based introduction to analytical methods, such as univariate and multivariate statistics, cluster analysis and ordination, and maximum likelihood estimation, using a conceptual approach. Introduction to analysis and programming using the R software package. Students cannot receive credit for this course and EART 225.

EART 126 - Geomechanics (5)

An integration of rock mechanics, geophysics, fluid flow, and geology to quantify stress state in the subsurface. Covers a range of topics including: basic constitutive laws for stress and strain, tectonic stress fields, the effects of fluids on rock and fault strength, natural and human-induced hydrofracture, human-induced seismicity, fault, drilling techniques for determining subsurface physical rock properties, and fault zones drilling.

Prerequisite: Prerequisite(s): PHYS 5A or PHYS 6A, and EART 110B.

EART 127 - Measuring Earth's 4.5 Billion-Year History (5)

Introduces the methodology for measuring the timing of events in Earth's past. Topics include: radiogenic and stable isotopes, chemostratigraphy and paleomagnetism. Case studies focus on

reconstructing the timing of major extinction and climatic events in Earth's history. Students cannot receive credit for this course and EART 127.

Prerequisite: Prerequisite(s): EART 110B.

EART 128 - Isotopes: Fundamentals and Applications in Earth and Marine Sciences (5)

Explores the fundamentals and concepts of stable, radiogenic, and cosmogenic isotope chemistry with applications relevant to Earth, marine, and biological sciences.

Prerequisite: Prerequisite(s): EART 110B or permission of instructor.

EART 129 - Global Change (5)

Covers the science of past and future climate change. Topics include: drivers of radiative forcing; carbon cycle; climate history of Earth; climate feedbacks; detection and attribution of climate change; climate change responses, impacts, adaptation, and mitigation.

Prerequisite: Prerequisite(s): MATH 11B and CHEM 1C. Enrollment is restricted to environmental sciences majors and Earth sciences majors.

EART 130 - Igneous and Metamorphic Petrology (5)

Introduction to the relationship between tectonic environments and the genesis of rock assemblages, primarily igneous and metamorphic. Examples from California and elsewhere are used to illustrate petrogenetic processes and characteristic petrologic features of rocks from all major tectonic settings.

Prerequisite: Prerequisite(s): EART 110B. Concurrent enrollment in EART 130L is required.

EART 130L - Igneous and Metamorphic Petrology Laboratory (2)

An introduction to optical mineralogy and the petrography of igneous rocks.

Prerequisite: Prerequisite(s): EART 110B. Concurrent enrollment in EART 130 is required.

EART 131 - Sea Level Change (5)

From the origin of the oceans to the modern climate crisis, this course aims to explore sea-level change over a wide range of timescales. The course links a series of solid Earth processes, such as mantle convection, viscoelastic deformation, and plate tectonics, to the past climate record. Students investigate how these processes contribute to our understanding of past, present, and future changes in sea level and climate.

Prerequisite: Prerequisite(s): EART 5 or EART 10 or EART 20; and MATH 11A or MATH 19A or MATH 20A; and PHYS 5A or PHYS 6A.

EART 134 - Thermochemistry of Geologic Systems (5)

Introduction to the thermodynamic and kinetic principles with a strong emphasis on applications to Earth materials. Implications for phase equilibria, geothermometry/geobarometry, element

partitioning, and physical properties of minerals, magmas, and solutions.

Prerequisite: Prerequisite(s): EART 110B.

EART 135L - Practical Geochemistry (5)

Provides hands-on exposure to geochemical instrumentation with a focus on data collection. Practical labs apply sample imaging, isotopic major- and trace-element measurements to natural samples. Laboratory sessions are supported by instruction, geochemistry, and Earth science.

Prerequisite: Prerequisite(s): EART 5, or EART 10, or EART 20. EART 110B is recommended. Enrollment is restricted to majors and minors in Earth sciences and the combined majors with anthropology and environmental studies.

EART 140 - Geomorphology (5)

An introduction to the evolution of the Earth's landscape, with emphasis on the processes responsible. Review of climatic and tectonic forcing followed by detailed discussion of weathering, glaciers, hillslopes, wind, rivers, and coastal processes with emphasis on their geographic distribution. One single day and one three-day field trip.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements and EART 110A. Concurrent enrollment in EART 140L is required.

EART 140L - Geomorphology Laboratory (2)

Laboratory sequence illustrating topics covered in course 140. These extensive laboratory exercises emphasize the quantification of the geomorphic processes and forms, and on the writing of concise summaries of the science in the form of abstracts.

Prerequisite: Prerequisite(s): Concurrent enrollment in EART 140 is required.

EART 142 - Engineering Geology for Environmental Scientists (5)

Introduction to the formation, composition, and classification of soils; the chemical interaction of soil and groundwater; and basic soil mechanics: stress-strain behavior, effective stress concept, consolidation, soil testing methods. Applications to problems including slope stability, landslides, liquefaction, subsidence, soil creep, debris flows. Laboratory: 3 hours.

Prerequisite: Prerequisite(s): EART 5 or EART 10 or EART 20; and MATH 11A or MATH 19A or AM 15A.

EART 146 - Groundwater (5)

Explores saturated and unsaturated fluid flow below Earth's surface, well hydraulics, and resource evaluation and development. Introduces modeling, field techniques, geochemistry, and contaminant transport and remediation. Problem set and laboratory each week; final paper. Laboratory: 3 hours. Alternates annually with course 116.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; and EART 5 or EART

10 or EART 20; and MATH 11A or MATH 19A or AM 15A; and PHYS 6A and PHYS 6L; and CHEM 1A, or by permission of the instructor. Enrollment is restricted to majors and minors in Earth sciences, the combined majors with anthropology, and environmental studies majors, and the environmental sciences major. EART 5L or EART 10L or EART 20L and PHYS 6B PHYS 6M are recommended as preparation.

EART 148 - Glaciology (5)

Introduction to the role of snow and ice in the dynamics of the earth surface system. Snow deposition and metamorphosis. Heat and mass balance at snow and ice surfaces. Flow of glaciers, ice sheets, and sea ice. Methods of climate reconstruction. Ice age theories.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, and EART 5 or EART 10 or EART 20; and MATH 11A or MATH 19A or AM 15A.

EART 150 - Structural Geology (5)

Principles and methods of analysis of brittly and ductily deformed rocks. Includes descriptions of structures, field analysis of structures, and mechanics of deformation. Three day-long field trips on weekends.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, and EART 110A or EART 110B; EART 109 recommended; concurrent enrollment in EART 150L is required.

EART 150L - Structural Geology Laboratory (2)

Structural analysis of faults, folds, and maps. Use of stereographic projections. Cross section construction and balancing from field data.

Prerequisite: Concurrent enrollment in EART 150 is required.

EART 152 - Tectonics (5)

The processes, techniques, and interpretations involved in the study of active crustal movements; constraints from plate tectonics; horizontal and vertical motions and rates; geodesy, including GPS; stress measurement; image interpretation; fault system analysis; paleoseismicity; fluid effects. Examples from the circum-Pacific. Laboratory-3 hours. Students cannot receive credit for this course and course 207. Students are billed a materials fee.

Prerequisite: Prerequisite(s): EART 10 or EART 5 or EART 20; and EART 10L or EART 5L or EART 20L; and PHYS 5A or PHYS 6A or equivalent per instructor permission.

EART 160 - Planetary Science (5)

Broad introduction to planetary science. Topics include the fundamental characteristics of solar system bodies; space exploration of these bodies; formation and evolution of surfaces, atmospheres and interiors of planets, satellites and small bodies.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, and MATH 11B or MATH 19B or AM 15B; and PHYS 5A or PHYS 6A.

EART 162 - Planetary Interiors (5)

The chemical and thermal structure and evolution of silicate planet interiors. Topics include equation of state of mantle and core materials, thermal history of the mantle and core, dynamics of mantle convection, geophysical determination of interior structure. Students cannot receive credit for this course and EART 262.

Prerequisite: Prerequisite(s): EART 160; and EART 111 or MATH 22 or MATH 23A; and PHYS 5C or PHYS 6C.

EART 163 - Planetary Surfaces (5)

Comparative study of surfaces and atmospheres of planetary bodies in solar system, focusing on comparative planetology and geophysical processes at work, including differentiation, impact cratering, tectonics, volcanism, and geomorphic evolution. Explores terrestrial planets, giant planets and their moons. Students cannot receive credit for this course and EART 263.

Prerequisite: Prerequisite(s): EART 160 or PHYS 116A.

EART 164 - Planetary Atmospheres (5)

A quantitative study of the origin, chemistry, dynamics, and observations of the atmospheres of terrestrial and gas-giant planets. Students cannot receive credit for this course and EART 264.

Prerequisite: Prerequisite(s): EART 160 or PHYS 116A.

EART 165 - History and Geochemistry of the Solar System (5)

Introduces solar system history and geochemistry. Observation methods and tools discussed include major and trace element geochemistry, geothermometry, radiogenic and stable isotopes. Solar system reconstructed through the examination of meteorites from different parent bodies. Taught in conjunction with EART 268. Students cannot receive credit for this course and EART 268.

EART 172 - Geophysical Fluid Dynamics (5)

Introduces fluid motion influenced by rotation. Topics include the Coriolis force, geostrophic flow, potential vorticity, the shallow water model, quasigeostrophic approximation, planetary waves, Ekman theory, thermal wind, models of the large-scale oceanic and atmospheric circulation, and equatorial dynamics. Taught in conjunction with EART 272. Students cannot receive credit for this course and EART 272.

Prerequisite: Prerequisite(s): PHYS 107 or AM 107; MATH 22 or MATH 23B recommended.

EART 189A - Geographic Information Systems with Applications in Earth Sciences (5)

Introduces Geographic Information Systems (GIS) for geologic mapping and interpretation. Students gain experience with satellite, air photo, and digital elevation model (DEM) interpretation, and research the geology, tectonics, paleontology, and stratigraphy for field sites in eastern California. Prerequisite(s): EART 109, EART 109L, EART 110A, and EART 110. Enrollment is restricted to Earth sciences

majors, and combined Earth sciences/environmental studies majors. Enrollment via an application.

EART 189B - Summer Field Study (5)

Students spend three weeks in this field course on advanced geologic mapping acquiring and analyzing original data and then another 11 days refining their interpretations. Emphasis is on geologic mapping, stratigraphy, structure and tectonic analysis, and petrology. Students are billed a fee.

Prerequisite(s): EART 109, EART 109L, EART 110A, EART 110L, EART 110B, EART 110M, and EART 189A and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to Earth sciences and combined Earth sciences/environmental studies majors. Enrollment via an application.

EART 190 - Earth Sciences Mentorship (1)

Faculty research activity, analytic facilities, and career counseling in three separate Earth sciences laboratories are offered with varied formats including field trips, discussions, and equipment demonstrations. Three different faculty participate in each offering.

Prerequisite: Enrollment is restricted to Earth sciences, Earth sciences/anthropology, and environmental studies/Earth sciences majors.

EART 191A - Climate Change Science and Policy (5)

Explores the scientific basis of current and pending climate change, and the state of climate policy issues in California, the nation, and the world. Work includes foundational lectures on both public policy and climate science; additional guest lectures from policy makers, politicians, and scientists. Students are introduced to and become familiar with addressing climate-change issues from both policy and scientific perspectives; research papers and public presentations are required activities.

Prerequisite: Prerequisite(s): Satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior majors in Earth sciences and the combined major with anthropology.

EART 191B - Planetary Capstone (5)

Examines a crosscutting topic in planetary sciences (e.g., volcanism) to satisfy the senior capstone requirement. Students are assessed on the basis of an oral presentation and a written report in which a synthetic review is present.

Prerequisite: Prerequisite(s): EART 160, and EART 111 or MATH 22. Enrollment is restricted to seniors and graduate students.

EART 191C - Practical Geophysics (5)

Hands-on practice analyzing real-life observational data including earthquake catalogs, seismograms, gravity, and GPS data. Emphasis on data collection, and access and manipulation skills. Introduction to MATLAB programming included. Students cannot receive credit for this course and EART 266.

Prerequisite: Prerequisite(s): EART 112 or EART 119; and EART 110C, and satisfaction of the Entry Level Writing and Composition requirements.

EART 194F - Education Capstone (2)

Students write a paper on a lesson plan developed after their CalTeach internship courses. This independent study is supervised by Earth and planetary sciences faculty or ocean sciences faculty, as well as a member of the CalTeach staff or Education Department.

Prerequisite: Prerequisite(s): EDUC 185C and EDUC 185L. Enrollment is restricted to Earth and planetary sciences majors with a concentration in science education.

EART 195 - Senior Thesis (5)

Students submit petition to sponsoring agency. Enrollment is restricted to seniors. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

EART 196B - Tutoring Earth Sciences in the University (5)

Students facilitate laboratory and field exercises in conjunction with faculty and teaching assistants in various Earth sciences courses. May not count toward upper-division major requirements. Approval of sponsoring agency; interview, and selection by primary instructor of specific courses required.

EART 196C - Tutoring Earth Sciences in the University (2)

Students facilitate laboratory and field exercises in conjunction with faculty and teaching assistants in various Earth sciences courses. May not count toward upper-division major requirements. Approval of sponsoring agency; interview, and selection by primary instructor of specific courses required. Enrollment restricted to Earth sciences, Earth sciences/anthropology, and environmental studies/Earth sciences majors.

EART 198 - Earth Sciences Internship (5)

A supervised learning experience involving practical application of Earth sciences through working with approved companies, governmental agencies, or research organizations. Students consult weekly with supervising faculty and prepare a final report of their work. Consult sponsoring agency for enrollment criteria. After instruction on resume preparation and interview skills, students must interview and be selected for internship by approved sponsoring organizations. Enrollment is restricted to Earth sciences, Earth sciences/anthropology, and environmental studies/Earth sciences majors.

EART 198F - Earth Sciences Internship (2)

A supervised learning experience involving practical application of Earth sciences through working with approved companies, governmental agencies, or research organizations. Students consult weekly with supervising faculty and prepare a final report of their work. May not be counted toward upper-division major requirements. Consult sponsoring agency for enrollment criteria. After instruction on resume preparation and interview skills, student must interview and be selected for internship by approved sponsoring organizations. Enrollment is

restricted to Earth sciences, Earth sciences/anthropology, and environmental studies/Earth sciences majors.

EART 199 - Tutorial (5)

Introduction to research in laboratory, field, or theoretical subjects as an independent study. Students submit petition to sponsoring agency.

EART 199F - Tutorial (2)

Introduction to research in laboratory, field, or theoretical subjects as an independent study. May not be counted toward upper-division major requirements. Students submit petition to sponsoring agency.

Graduate

EART 203 - Introductory Teaching Seminar (1)

Intended for new Earth sciences graduate students. Focus on preparation, assessment, and feedback. Classroom techniques, organizational and time management strategies, practice teaching sessions specific to laboratory and/or science instruction. Required follow-up meetings to discuss practical teaching experience.

Prerequisite: Enrollment is restricted to graduate students.

EART 204 - Earth and Planetary Sciences Foundations (5)

Provides a comprehensive overview of key concepts, dominant paradigms, and research frontiers in Earth and planetary sciences in plenary talks by multiple faculty. Provides a required foundation course for all incoming students pursuing graduate degrees in Earth and planetary sciences.

Prerequisite: Enrollment is restricted to Earth sciences graduate students.

EART 206 - Great Papers in the Earth Sciences (5)

Exposure to the most important ideas in the Earth sciences through exploration of the primary literature. Seminal papers in different subdisciplines of the Earth sciences are read and analyzed to provide breadth and improve students' ability to think critically.

Prerequisite: Enrollment is restricted to Earth sciences graduate students.

EART 207 - Tectonics (5)

An overview of tectonic theory and processes for application to the Earth sciences. The course explores the primary tools of tectonic interpretation including plate kinematics, rheology, plate boundary dynamics, and the behavior of active fault systems. Taught in conjunction with EART 152. Students cannot receive credit for this course and EART 152.

Prerequisite: Prerequisite(s): graduate standing or permission of instructor.

EART 208 - Methods in Paleoclimatology (5)

Addresses methods used to reconstruct aspects of paleoclimates and paleoenvironments from the geologic record, focusing

primarily on terrestrial records. Topics to be covered include dendrochronology and dendroclimatology, paleopalynology, paleobotany, ice cores, and paleosol studies. Lectures, discussions, and laboratory work.

Prerequisite: Enrollment is restricted to graduate students.

EART 219 - Advanced Scientific Programming (5)

Advanced programming course designed to cover the basic software design workflow in the context of scientific computing, including specific topics such as using Linux, cloud computing, version control, numerical simulation, computer vision, and machine learning. Learners should bring basic Python experience (e.g., prerequisite EART 119A) or significant programming experience in another language. The final project has learners collaborate on developing a scientific computing project, collaboratively implement the project with git version control and then deploy the repository for computation on the UCSC Hummingbird cluster or in the cloud. Taught in conjunction with EART 119B. Students cannot receive credit for this course and EART 119B.

Prerequisite: Enrollment is restricted to graduate students.

EART 220 - Ground Water Modeling (5)

Introduction to building and using models to solve hydrogeologic problems. Modeling methods include mainly analytical and finite-difference. Emphasis on using models rather than the details of their functioning, although some coding is required. Comfort with mathematical methods and computers expected. Course designed for graduate students, but available to qualified Earth science majors.

Prerequisite: Prerequisite(s): graduate standing or permission of instructor required. One year of calculus and courses in differential equations and basic hydrologic principles are recommended as preparation.

EART 225 - Statistics and Data Analysis in the Geosciences (5)

Using a conceptual approach, this course is a project-based introduction to analytical methods, such as univariate and multivariate statistics, cluster analysis and ordination, and maximum likelihood estimation. Introduces analysis and programming using the R software package. Students cannot receive credit for this course and EART 125.

Prerequisite: Enrollment is restricted to graduate students.

EART 227 - Measuring Earth's 4.5 Billion Year History (5)

Introduces the methodology for measuring the timing of events in Earth's past. Topics include: radiogenic and stable isotopes chemostratigraphy and paleomagnetism. Case studies focus on reconstructing the timing of major extinction and climatic events in Earth's history. Students cannot receive credit for this course and EART 127.

Prerequisite: Enrollment is restricted to graduate students.

EART 229 - Isotopic Methods in Environmental Science (5)

Explores how natural variations in stable isotope ratios answer questions in ecology, paleobiology, and other environmental

sciences. Format includes lectures by the instructor and student presentations on applications following literature-based research on each topic.

Prerequisite: Enrollment is restricted to graduate students.

EART 240 - Communicating Science (3)

Introduces inquiry-based instructional strategies for communicating a passion for science. These strategies, combined with content knowledge and enthusiasm for sharing it, equips college students to introduce science to K-8 students and teachers in local schools.

Prerequisite: Enrollment is restricted to graduate students.

EART 252 - Hydroclimatology (5)

An interdisciplinary investigation of the interaction between terrestrial systems and climate, with a focus on the cycling of water between atmosphere, land, and biosphere. Lecture topics include the global energy budget, atmospheric general circulation and climate, water balance, surface energy fluxes, watershed hydrology, modeling of terrestrial ecosystems, and climate-vegetation dynamics. Complementary discussions of the scientific literature provide perspective on how these systems affect and are affected by climate change.

Prerequisite: Enrollment is restricted to graduate students.

EART 254 - The Climate System (5)

Focuses on atmospheric and oceanic processes that are important within the Earth's climate system, especially those that operate on annual to centennial time scales. Format includes lectures by the instructors, paper readings, and discussion.

Prerequisite: Enrollment is restricted to graduate students.

EART 258 - Deep Time Paleoclimates (5)

Weekly lectures/readings/presentations focused on the key events in the long-term evolution of Earth's climate (i.e., before the Pliocene), including early Archean, faint, young-sun period; Proterozoic snowballs; Paleozoic glaciations and greenhouse events; the mid-Cretaceous oceanic anoxic events (OAEs); and Paleogene thermal maxima and glacial intervals. Considerable emphasis on evaluating the proxies of climate and mechanisms of climate change (e.g., greenhouse gasses, paleogeography).

Prerequisite: Enrollment is restricted to graduate students.

EART 262 - Planetary Interiors (5)

The chemical and thermal structure and evolution of silicate planet interiors. Topics include equation of state of mantle and core materials, thermal history of the mantle and core, dynamics of mantle convection, geophysical determination of interior structure. Students cannot receive credit for this course and EART 162.

Prerequisite: Enrollment is restricted to graduate students.

EART 263 - Planetary Surfaces (5)

Comparative study of surfaces of planetary bodies in our solar system, focusing on comparative planetology and geophysical processes at work, including differentiation; on-impact cratering; tectonics; volcanism and geomorphic evolution; and exobiology. Explores terrestrial planets, giant planets and their moons, and trans-Neptunian objects, focusing on modern exploration. Students cannot receive credit for this course and EART 163.

Prerequisite: Enrollment is restricted to graduate students.

EART 264 - Planetary Atmospheres (5)

Quantitative study of the origin, chemistry, dynamics, and observations of the atmospheres of terrestrial and gas giant planets. Students cannot receive credit for this course and EART 164.

Prerequisite: Enrollment is restricted to graduate students.

EART 265 - Order of Magnitude Estimation (5)

Practice in making rough estimates and leading-order approximations in physical and chemical processes.

Prerequisite: Enrollment is restricted to graduate students.

EART 266 - Geologic Signal Processing and Inverse Theory (5)

Theoretical and practical aspects of digital signal analysis including data sampling, spectral estimation, digital filtering, statistical estimation, correlation tools, and principle-component analysis. Emphasis on practical examples of geophysical time series. Multivariable calculus and linear algebra are required and used extensively in the course. Taught in conjunction with EART 191C. Students cannot receive credit for this course and EART 191C.

Prerequisite: Enrollment is restricted to graduate students.

EART 268 - History and Geochemistry of the Solar System (5)

Introduction of solar system history and geochemistry. Observation methods and tools discussed include major and trace element geochemistry, geothermometry, radiogenic and stable isotopes. Course reconstructs solar system history through the examination of meteorites from different parent bodies. Students cannot receive credit for this course and EART 165.

Prerequisite: Enrollment is restricted to graduate students.

EART 270 - Global Seismology (5)

Introduction to quantitative earthquake and global Earth structure seismology. Topics include basic elasticity, wave characteristics, seismic ray theory, wave reflection, surface waves, normal modes, seismic instrumentation, application of seismic waves to reveal Earth structure and resulting models, representation of earthquake sources such as explosions and faulting, earthquake rupture scaling, modern methods of modeling seismic recordings to study source complexity, and an introduction to seismotectonics. Laboratory: 3 hours.

Prerequisite: Enrollment is restricted to graduate students.

EART 271 - Current Research Topics in Deep Earth Processes (5)

Students and instructor lead discussions of recent and significant publications in geophysics and chemistry of deep Earth. Articles structured around current theme of interest are selected by participants and approved by instructor. Emphasis on defining multidisciplinary significance of each article and its relationship to fundamental processes in deep Earth, including core and mantle. Designed for graduate students but available to qualified Earth sciences majors.

EART 272 - Geophysical Fluid Dynamics (5)

Introduces fluid motion influenced by rotation. Topics include the Coriolis force, geostrophic flow, potential vorticity, the shallow water model, quasigeostrophic approximation, planetary waves, Ekman theory, thermal wind, models of the large-scale oceanic and atmospheric circulation, and equatorial dynamics. Students cannot receive credit for this course and EART 172.

Prerequisite: Enrollment is restricted to graduate students.
Crosslisted as: Enrollment is restricted to graduate students.

EART 273 - Earthquake Physics (5)

Why do earthquakes happen? Topics include friction, fracture, earthquake triggering, stress in the crust, observed source scalings, and seismicity statistics. Emphasis on observations and current research topics. (Formerly course 290J, Topics in Earthquake Physics.)

Prerequisite: Enrollment is restricted to graduate students and advanced undergraduates.

EART 274 - Crustal Deformation (5)

Advanced study of the deformation processes in the Earth's crust and upper mantle. Covers fundamental theories of stress and strain, brittle fracture, friction, ductile deformation and flow laws, earthquake processes, faults and shear zones, scaling lab-derived measurements to tectonic plate scale.

Prerequisite: Enrollment is restricted to graduate students.

EART 278A - Advanced Seismology (5)

Elastic wave propagation. Advanced topics in ray theory, WKBJ solutions in seismology, singularities and nonlinearities, surface wave theory, propagating matrices, normal modes, and inversion theory. Selected topics in time series analysis and seismic signal processing, seismic wave dispersion.

Prerequisite: Course is designed for graduate students but available to qualified Earth sciences majors. PHYS 110B and PHYS 116C are recommended as preparation. Enrollment is restricted to graduate students.

EART 280D - Short Course in Atmospheric/Climate Science (3)

Addresses specialized topics in atmospheric and/or climate science that are too narrow for a full (5-credit) format. Examples include: cloud physics; atmospheric boundary layer;

aerosol physics and chemistry; atmospheric radiation; atmospheric thermodynamics.

Prerequisite: Enrollment is restricted to graduate students.

EART 290B - Topics in Glaciology (5)

Advanced review of the physics and chemistry of ice and snow. Mass and heat balance of ice masses. Motion of glaciers and ice sheets. Subglacial and englacial hydrology. Thermodynamics of ice masses and the linkage to climate.

Prerequisite: Enrollment is restricted to graduate students.

EART 290C - Topics in Geophysics (5)

Different problems and approaches will be stressed from year to year such as geotectonics, paleomagnetism, or properties and processes in the mantle and core.

Prerequisite: Enrollment is restricted to graduate students; qualified Earth sciences majors by permission of instructor.

EART 290D - Petrology and Plate Tectonics (5)

Selected topics illustrating relationships between igneous and metamorphic rocks and plate tectonics are explored in detail. Designed for graduate students but available to qualified Earth sciences majors.

EART 290E - Topics in Planetary Science (5)

We examine one well-defined topic in planetary science, beginning with a summary of current knowledge and concluding with the latest research literature. Topics will vary from year to year and may include planetary collisions, terrestrial planets, origin of planetary systems, small bodies, the New Mars, and satellites of Jupiter. Achievement will be evaluated based on class participation, exams, and a research project.

Prerequisite: Open to undergraduate majors with permission of instructor. Enrollment is restricted to graduate students.

EART 290F - Topics in Coastal Processes (2)

Instructor and students lead discussions and make presentations on current research, problems, and publications in coastal processes. These topics include littoral drift, sediment transport and storage on the inner shelf, shoreline erosion/change and its documentation, and related issues.

Prerequisite: Enrollment is restricted to graduate students.

EART 290G - Topics in Global Tectonics (5)

Explores different problems of special interest in global tectonics with the approach of integrating marine and terrestrial geologic and geophysical information. Course designed for graduate students but available to qualified Earth sciences majors.

EART 290H - Topics in Hydrogeology (5)

Selected topics in groundwater, hydrothermal systems, and related subjects. Discussion of theoretical models, field and laboratory approaches, and recent research. Topics vary from

year to year. Course designed for graduate students but available to qualified Earth sciences majors.

EART 290I - Topics in Geomorphology (5)

Discussion of journal articles focused on a theme in contemporary geomorphology. Topics include: coupling of climate; tectonics and landscape evolution; mechanics of bedrock river channels; fundamentals of fluvial gravel transport; and inference of tectonic rates and processes from analysis of topography.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll by permission of instructor.

EART 290K - Paleontology Seminar (3)

Seminar discussion based on current readings in the literature around some topic in the history and evolution of life.

Prerequisite: Course designed for graduate students but available to qualified upper-division science students.

EART 290L - Topics in Climate Change (5)

Explores current issues and recent developments in the field of past, present, and future climate change. Topic is different each year, but focuses on the interaction between different components of Earth's environment and the effect of that interaction on climate change. Designed for graduate students but open to qualified undergraduates.

Prerequisite: Enrollment is restricted to graduate students.

EART 290M - Topics in Atmospheric Science (5)

Selected topics encompassing atmospheric physics and chemistry. Topics vary from year to year. Sample topics include: atmospheric physics, atmospheric chemistry, boundary layer meteorology, aerosol science, and atmospheric thermodynamics.

Prerequisite: Designed for graduate students, but qualified undergraduates may enroll with permission of instructor.

EART 290N - Topics in Mineral Physics (5)

Selected topics encompassing the physics and chemistry of Earth's interior, planetary physics, high-pressure experimental geophysics and material properties at high pressure and temperature. Topics vary from year to year.

Prerequisite: Enrollment is restricted to graduate students and qualified Earth sciences majors by permission of instructor.

EART 290O - Topics in Hydrology (5)

Selected topics in watershed hydrology and related subjects. Discussion journal articles focused on fundamental concepts, scientific breakthroughs, and innovative methods. Topics include: water storage, runoff generation and thresholds, hydrologic connectivity, and ecohydrology.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with permission of the instructor.

EART 290P - Interdisciplinary Topics in the Earth Sciences (5)

An understanding of the chemical and physical properties and processes in the earth is sought by integrating information from several subdisciplines in the Earth sciences. Topics vary from year to year, focusing on areas of active research. Course designed for graduate student but available to qualified Earth sciences majors.

Prerequisite: Prerequisite(s): graduate standing or permission of instructor. Course is designed for graduate student but available to qualified Earth sciences majors.

EART 290Q - Topics in Outer Solar System (5)

Exploration of the planets and satellites beyond the asteroid belt, with an emphasis on the underlying physical processes at work. Course includes lectures, computer practicals, and student presentations.

Prerequisite: Enrollment is restricted to graduate students.

EART 290R - Topics in the Chemistry and Physics of the Earth (5)

Explores problems and current research developments in the application of physics and chemistry to planetary interiors. Topics differ from year to year and include, but are not limited to, research related to the accretion, differentiation, evolution, and structure of the terrestrial planets. Course is designed for graduate students but available to qualified Earth sciences majors.

EART 290T - Current Research Topics in Paleoceanography and Paleoclimatology (5)

Students and instructor lead discussions of recent and significant problems in paleoceanography and paleoclimatology. Articles structured around current themes of interest are selected by the instructor. Emphasis on major climatic transitions or events which noticeably influenced evolution of biota. Course is designed for graduate students but available to qualified Earth sciences majors.

EART 290U - Topics in Thermochronology (5)

Surveys the use of thermochronometry to quantify the rates of tectonic processes. Topics include heat conduction and diffusion; radioactive decay; analytical methods; and modeling of thermochronologic data. Seminars review seminal papers from the literature.

Prerequisite: Enrollment is restricted to graduate students.

EART 290X - Topics in Modeling Planetary Interiors (5)

Introduces computer modeling of thermal convection in planetary interiors. Students learn to write and run a basic computer code using spectral and finite-difference methods, then are shown how to improve the numerical method and physics. Basic computer programming experience is required (for example, in Fortran, C, IDL, or MATLAB).

Prerequisite: Course is designed for and enrollment restricted to graduate students, but available to qualified science majors.

EART 292 - Seminar (0)

Weekly seminar attended by faculty, graduate students, and upper-division undergraduate students.

EART 293 - Graduate Research Seminar (1)

Weekly seminar series covering a broad spectrum of topics in the Earth sciences. Graduate students give 15- to 20-minute oral presentations on current or anticipated research.

Prerequisite: Enrollment is restricted to graduate students.

EART 296 - Special Student Seminar (5)

Permission of instructor required.

EART 297A - Independent Study (5)

Permission of instructor required.

EART 297B - Independent Study (10)

Permission of instructor required.

EART 297C - Independent Study (15)

Permission of instructor required.

EART 298 - Earth Sciences Internship (5)

A supervised learning experience involving practical, graduate-level application of Earth sciences through working with approved companies, governmental agencies, or research organizations. Students consult weekly with supervising faculty and prepare a final report of their work. Consult sponsoring agency for enrollment criteria. After instruction on resume preparation and interview skills, students must interview and be selected for internship by approved sponsoring organizations.

EART 299A - Thesis Research (5)

Permission of instructor required.

EART 299B - Thesis Research (10)

Permission of instructor required.

EART 299C - Thesis Research (15)

Permission of instructor required.

ECE - ELECTRICAL AND COMPUTER ENGINEERING

Lower-Division

ECE 1 - Hands-On Computer Engineering (2)

Hands-on introduction to computer engineering practice and research, including computer hardware, robotics, and embedded systems. Encourages interaction with UCSC's School of Engineering community. Designed for students without previous background in computer engineering. (Formerly Computer Engineering 1.)

Prerequisite: Enrollment restricted to first-year students and sophomores.

ECE 8 - Robot Automation: Intelligence through Feedback Control (5)

Introduction to dynamical systems, feedback control, and robotics. Fundamental concepts in dynamical systems, modeling, stability analysis, robustness to uncertainty, feedback as it occurs naturally, and the design of feedback-control laws to engineer desirable static and dynamic response. Course includes an introduction to MATLAB and programming in MATLAB.

Prerequisite: Priority enrollment restricted to first-year students and sophomores.

ECE 9 - Statics and Mechanics of Materials (5)

Theory and application of statics and mechanics of materials for mechanical and biomechanical systems. Covers statics of particles; equilibrium of rigid bodies; free-body diagrams; analysis of structure; friction; concepts of stress and strain; axial loading; torsion and bending; and failure criteria. (Formerly Introduction to Statics, Dynamics, and Biomechanics.)

Prerequisite: Prerequisite(s): MATH 19A; and PHYS 5A and PHYS 5L or PHYS 6A and PHYS 6L; and AM 10 or MATH 21.

ECE 10 - Fundamentals of Robot Kinematics and Dynamics (5)

Covers the theory and application of mathematical models to analyze the kinematics and dynamics of robot mechanisms or their components using vector algebra, differential equations, and computer simulations; also covers robot vehicle kinematics, robot arm kinematics, and robot dynamics with computational examples and problems. Some basic programming skills and familiarity with MATLAB are expected. (Formerly CMPE 10.)

Prerequisite: Prerequisite(s): ECE 9, and AM 20 or MATH 24.

ECE 11 - 3D Prototyping (5)

Introduces the basics of rapid prototyping for robotics design from limiting stresses to optimal design. Discusses fast prototyping methods, advantages, and disadvantages. Introduces CAD, CAD packages, 3D printing with different materials, and 3D scanning. (Formerly CMPE 11.)

Prerequisite: Prerequisite(s): previous or concurrent enrollment in ECE 9.

ECE 13 - Computer Systems and C Programming (7)

Computer Systems and C Programming is intended to bring students up to speed on programming small and large programs in C. Originally written in 1978, C remains the most popular programming language, and the most used one in terms of numbers of computer programs written in it. The course approaches C from an embedded paradigm, and all programming assignments are on a 32-bit embedded micro, the Microchip PIC32. Students learn how to program in C, how to write modular code, and some of the tips and tricks when dealing with an embedded micro. This is a programming class

and students will write lots of code. Expect to spend at least 15-20 hours outside of class playing with the code to get things to work. (Formerly CSE 13E Embedded Systems and C Programming)

Prerequisite: Prerequisite(s): CSE 12. CSE 20 or CSE 30 (Python programming background) is recommended but not required. Programming experience in any other language is also acceptable.

ECE 30 - Engineering Principles of Electronics (5)

Suitable for sophomores pursuing computer science and engineering careers. Aims at deriving basic engineering principles directly from examples relevant to computing and electronics: 1) Newton's Laws and related fundamental mechanics; 2) basic thermodynamics and heat/energy transfer; 3) key electromagnetic principles, including Coulomb's Law, Gauss's Law, and basic circuit analysis using Kirchoff's Laws/Rules; and 4) Ray optics for fiber optic communications and camera electronics.

Prerequisite: Prerequisite(s): MATH 19B. Enrollment is restricted to computer engineering, computer science: computer game design, computer science, network and digital technology, and technology and information management majors and proposed majors; and to computer engineering, computer science, and technology and information management minors.

ECE 80B - Engineering Innovations for Medicine and Natural Sciences (5)

Introduces to a lay audience engineering innovations that have had an impact in medicine and biology. Course is designed for non-engineering majors, or pre-med students, as well as pre-engineering to provide a broad understanding of how technology has improved and keeps on improving healthcare.

ECE 80G - Creating and Financing a Sustainable Startup in the Global Economy (5)

Introduces students and prospective entrepreneurs to the ingredients required to successfully create and finance a sustainability-minded startup or nonprofit in the global economy. Emphasis is placed on ethical business practice, tools for understanding markets and supply chains, and building value for all stakeholders, including communities and the environment.

ECE 80H - Bending the Curve: Solutions to Climate Change (5)

Students examine the interconnectedness of natural and social systems as they evaluate, interpret, and debate evidence and explanations of climate change. Includes interviewing family members, friends, and professionals for a variety of divergent views on the climate change debate. Class sessions are devoted to student discussion of the course materials, including readings, take-home assignments and pre-recorded videos. The class culminates with a written proposal and group presentations of ideas for solutions, with the guidance of the instructor, addressing one of the "grand challenges" presented in the course with the goal of empowering students to emerge as critical thinkers and actors equipped with a solution-based mindset.

ECE 80E - Engineering Ethics (5)

Ethical theories, analysis, and their application to issues in the practice of engineering, such as safety and liability, professional responsibility to clients and employers, codes of ethics, legal obligations, environmental issues, and social issues. Emphasis on developing independent ethical analysis through the use of case studies. (Formerly CMPE 80E.)

ECE 80J - Renewable Energy Sources, Storage, and Smart Grids (5)

Introduces energy sources and storage with special emphasis on renewables as part of smart grids. Fundamental energy-conversion limits based on physics and existing source properties are studied. Various sources, such as solar, wind, hydropower, geothermal, tidal energy, and fuel cells are described. Electric vehicles, sustainable microgrids, and the integration to smart grids are studied. Finally, smart meters, demand response, the energy market, and policy are covered. Students cannot receive credit for this course and course 81J. (Formerly EE 80J.)

ECE 80S - Sustainability Engineering and Practice (5)

Topical introduction to principles and practices of sustainability engineering and ecological design with emphasis on implementation in society. Provides an understanding of basic scientific, engineering, and social principles in the design, deployment, and operation of resource-based human systems, and how they can be maintained for this and future generations. No specialized background in engineering, science, or social sciences is assumed. (Formerly EE 80S.)

ECE 80T - Modern Electronic Technology and How It Works (5)

Basic knowledge of electricity and how things work, how technology evolves, its impact on society and history, and basic technical literacy for the non-specialist. Broad overview of professional aspects of engineering and introduction and overview of basic systems and components. Topics include electrical power, radio, television, radar, computers, robots, telecommunications, and the Internet. (Formerly EE 80T.)

ECE 94 - Group Tutorial (5)

A means for a small group of students to study a particular topic in consultation with a faculty sponsor. Students submit petition to sponsoring agency.

ECE 94F - Group Tutorial (2)

A means for a small group of students to study a particular topic in consultation with a faculty sponsor. Students submit petition to sponsoring agency.

ECE 99 - Tutorial (5)

Students submit petition to sponsoring agency.

ECE 99F - Tutorial (2)

Students submit petition to sponsoring agency.

Upper-Division

ECE 101 - Introduction to Electronic Circuits (5)

Introduction to the physical basis and mathematical models of electrical components and circuits. Topics include circuit theorems (Thevenin and Norton Equivalents, Superposition), constant and sinusoidal inputs, natural and forced response of linear circuits. Introduction to circuit/network design, maximum power transfer, analog filters, and circuit analysis using Matlab. Topics in elementary electronics including amplifiers and feedback. (Formerly EE 101.)

Prerequisite: Prerequisite(s): PHYS 5C and PHYS 5N; or PHYS 6C and PHYS 6N; and MATH 24 or previous or concurrent enrollment in AM 20. Concurrent enrollment in ECE 101L is required.

ECE 101L - Introduction to Electronic Circuits Laboratory (2)

Illustrates topics covered in ECE 101. One two-hour laboratory session per week.

Prerequisite: Prerequisite(s): PHYS 5C and PHYS 5N or PHYS 6C and PHYS 6N; and MATH 24 or previous or concurrent enrollment in AM 20. Concurrent enrollment in ECE 101 is required.

ECE 102 - Properties of Materials (5)

The fundamental electrical, optical, and magnetic properties of materials, with emphasis on metals and semiconductors: chemical bonds, crystal structures, elementary quantum mechanics, energy bands. Electrical and thermal conduction. Optical and magnetic properties. (Formerly EE 145.)

Prerequisite: Prerequisite(s): PHYS 5A and PHYS 5L, PHYS 5B and PHYS 5M, and PHYS 5C and PHYS 5N; or PHYS 6A and PHYS 6L, PHYS 6B and PHYS 6M, and PHYS 6C and PHYS 6N. Concurrent enrollment in ECE 102L is required.

ECE 102L - Properties of Materials Laboratory (2)

Laboratory sequence illustrating topics covered in course 145. One two-hour laboratory per week.

Prerequisite: Prerequisite(s): PHYS 5A and PHYS 5L, PHYS 5B and PHYS 5M, and PHYS 5C and PHYS 5N; or PHYS 6A and PHYS 6L, PHYS 6B and PHYS 6M, and PHYS 6C and PHYS 6N. Concurrent enrollment in ECE 102 is required.

ECE 103 - Signals and Systems (5)

Course covers the following topics: characterization and analysis of continuous-time signals and linear systems, time domain analysis using convolution, frequency domain analysis using the Fourier series and the Fourier transform, the Laplace transform, transfer functions and block diagrams, continuous-time filters, sampling of continuous time signals, examples of applications to communications and control systems. (Formerly EE 103.)

Prerequisite: Prerequisite(s): ECE 101 and ECE 101L; and AM 20 or MATH 24.

ECE 103L - Signals and Systems Laboratory (2)

Use and operation of spectrum analyzers; advanced signal analysis using oscilloscopes; measuring impulse response, step response, frequency response, and computer analysis of real signals. MATLAB programming is taught and used as a tool for signal analysis. Students are billed a materials fee. (Formerly EE 103L.)

Prerequisite: Prerequisite(s): ECE 101 and ECE 101L and AM 20 or MATH 24. Concurrent enrollment in ECE 103 is required.

ECE 104 - Bioelectronics (5)

Covers selected case studies in interfacing electronic devices with biological systems. from Galvani to neuronal stimulation and electroceuticals. These studies include: the squid giant axon, the pace maker, deep brain stimulation, organic bioelectronics, bionanoelectronics and optogenetics, bioenergetics, and bioprotonics electroceuticals. Students are assessed through weekly student papers on case studies and through a final presentation. (Formerly EE 104.)

Prerequisite: Enrollment is restricted to juniors, seniors, and graduate students.

ECE 115 - Introduction to Solid Mechanics (5)

Introduces the solid mechanics of materials. Topics include: stress and strain, torsion, bending of beams, shearing stresses in beams, compound stresses, principal stresses, deflections of beams, and statically indeterminate members and columns. (Formerly CMPE 115.)

Prerequisite: Prerequisite(s): ECE 9 and MATH 19B, and AM 10 or MATH 21.

ECE 118 - Introduction to Mechatronics (10)

Technologies involved in mechatronics (intelligent electro-mechanical systems) and techniques necessary to integrate these technologies into mechatronic systems. Topics include electronics (A/D, D/A converters, opamps, filters, power devices), software program design (event-driven programming, state machine-based design), DC and stepper motors, basic sensing, and basic mechanical design (machine elements and mechanical CAD). Combines lab component of structured assignments with a large and open-ended team project. Students who enrolled in this class will learn how to solve engineering problems using the C Programming Language. Cannot receive credit for this course and ECE 218.

Prerequisite: Prerequisite(s): ECE 101 and ECE 101L and CSE 100 and CSE 100L; and ECE 13 or CSE 13E. ECE 121 and ECE 167 are highly recommended (but not required).

ECE 121 - Microcontroller System Design (7)

Focus is on the design and use of microcontroller-based embedded systems, specifically addressing issues of low-level functionality, direct manipulation of input/output using various specialized peripheral sets, and multiple communications protocols. Covers timers, Input Capture, Output Compare, ADC, PWM, interrupts, bus and memory organization, DMA,

SPI, I2C, device driver programming, serial packet communication, and clocking. Students enrolled in this class learn how to use the C programming language to solve engineering problems.

Prerequisite: Prerequisite(s): CSE 12; and ECE 13 or CSE 13E. Concurrent enrollment in ECE 101 and ECE 101L is required.

ECE 122A - Collaborative Sustainability Project Design (5)

This course is the first quarter of a three quarter series of courses that together comprise the IDEASS Program (Impact Designs: Engineering and Sustainability through Student Service), which provides students with opportunities to plan, implement, and evaluate interdisciplinary sustainable design projects in the built environment for the Monterey Bay Region. In fall quarter students are introduced to project topics and background information. In collaboration with an outside mentor project teams design, revise, and complete a project plan including project goals and deliverables, timeline of key activities and major milestones, stakeholder map, evaluation plan, and budget (as applicable). Students apply online; selected applicants complete in-person interviews. (Formerly EE 122A.)

ECE 122B - Collaborative Sustainability Project Implementation (5)

The second of a three-quarter sequence that together comprise the IDEASS Program (Impact Designs: Engineering and Sustainability through Student Service) which provides opportunities for students to plan, implement, and evaluate interdisciplinary sustainable-design projects in the built environment for the Monterey Bay Region. In winter quarter, project teams work collaboratively to implement the project plans approved during the fall quarter. Students participate in a weekly seminary series that includes guest lectures and field trips as well as workshops in project management, public speaking, writing skills, and other professional development. Prerequisite(s): ECE 122A. Students apply online; selected applicants complete in-person interviews. Enrollment is restricted to juniors and seniors. (Formerly EE 122B.)

ECE 122C - Collaborative Sustainability Project Implementation (5)

The third of a three-quarter sequence that together comprise the IDEASS Program (Impact Designs: Engineering and Sustainability through Student Service) which provides opportunities for students to plan, implement, and evaluate interdisciplinary sustainable-design projects in the built environment for the Monterey Bay Region. In spring quarter, project teams work collaboratively to continue implementation of project plans approved during the fall quarter, then evaluate projects impacts. Students participate in a weekly seminary series that includes guest lectures and field trips as well as workshops in project management, public speaking, writing skills, and other professional development. Students also work in the community on educational public outreach regarding project impacts. Prerequisite(s): ECE 122A. Students apply online; selected applicants complete in-person interviews. Enrollment is restricted to juniors and seniors. (Formerly EE 122C.)

ECE 129A - Capstone Project I (5)

First of a three-course sequence in which students apply knowledge and skills gained in elective track to complete a major design project. In this first course, students complete the specification and planning for a substantial project. Topics covered: engineering design cycle, engineering teams, and professional practices. (Formerly EE 129A.)

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements and CSE 100; enrollment restricted to senior Electrical Engineering and Robotics Engineering majors. Electrical Engineering majors must complete ECE 171; and ECE 157 or ECE 173 or ECE 118 or ECE 121. Robotics Engineering majors must complete ECE 118 and ECE 121.

ECE 129B - Capstone Project II (5)

Second of a three-course sequence in which students apply knowledge and skills gained in elective track to complete a major design project. In this second course, students complete the training, research, and procurement for a substantial project and a preliminary implementation.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements and ECE 129A. Enrollment is restricted to seniors.

ECE 129C - Capstone Project III (5)

Third of a three-course sequence in which students apply knowledge and skills gained in this elective track to complete a major design project. In this third course, students work in teams to complete the project specified and advance on the results of the work in the first two courses. A formal written report, oral presentation, and demonstration of the successful project to a review panel of engineering faculty is required.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements and ECE 129B. Enrollment is restricted to seniors.

ECE 130 - Introduction to Optoelectronics and Photonics (5)

Introduction to optics, photonics and optoelectronics, fiber optic devices and communication systems: Topics include: ray optics, electromagnetic optics, resonator optics, interaction between photons and atoms, dielectric waveguides and fibers, semiconductor light sources and detectors, modulators, amplifiers, switches, and optical fiber communication systems. Taught in conjunction with course 230. Students cannot receive credit for this course and ECE 230. (Formerly EE 130.)

Prerequisite: Prerequisite(s): PHYS 5B and PHYS 5C, or PHYS 6B and PHYS 6C; concurrent enrollment in PHYS 130L.

ECE 130L - Introduction to Optoelectronics Laboratory (1)

Includes a series of projects to provide hands-on experience needed for basic concepts and laboratory techniques of optical fiber technology.

Prerequisite: Prerequisite(s): PHYS 5L, PHYS 5M, and PHYS 5N, or PHYS 6L, PHYS 6M, and PHYS 6N; concurrent enrollment in ECE 130.

ECE 135 - Electromagnetic Fields and Waves (5)

Vector analysis. Electrostatic fields. Magnetostatic fields. Time-varying fields and Maxwell's equations. Plane waves. (Formerly EE 135.)

Prerequisite: Prerequisite(s): ECE 101 and ECE 101L; MATH 23B; and MATH 24 or AM 20. Students must concurrently enroll in ECE 135L.

ECE 135L - Electromagnetic Fields and Waves Laboratory (2)

Laboratory sequence illustrating topics in course 135. One two-hour laboratory session per week.

Prerequisite: Prerequisite(s): ECE 101 and ECE 101L; MATH 23B; and MATH 24 or AM 20. Students must concurrently enroll in ECE 135.

ECE 136 - Engineering Electromagnetics (5)

Course will cover electromagnetic wave propagation, transmission lines, waveguides, and antennas. (Formerly EE 136.)

Prerequisite: Prerequisite(s): ECE 135 and ECE 135L. Enrollment is restricted to School of Engineering and Division of Physical and Biological Sciences majors or permission of instructor.

ECE 141 - Feedback Control Systems (5)

Analysis and design of continuous linear feedback control systems. Essential principles and advantages of feedback. Design by root locus, frequency response, and state space methods and comparisons of these techniques. Applications. (Formerly CMPE 141 and EE 153.)

Prerequisite: Prerequisite(s): ECE 103. Enrollment is restricted to School of Engineering and Division of Physical and Biological Sciences majors, or by permission of instructor.

ECE 145 - Estimation and Introduction to Control of Stochastic Processes (5)

Provides practical knowledge of Kalman filtering and introduces control theory for stochastic processes. Selected topics include: state-space modeling; discrete- and continuous-time Kalman filter; smoothing; and applications in feedback control. Students learn through hands-on experience. Students cannot receive credit for this course and course 245. Enrollment by permission of instructor. (Formerly CMPE 145.)

ECE 149 - Introduction to Cyber-physical Systems (5)

Presents the basic concepts and tools for the study of cyber-physical systems, including modeling and analysis tools for continuous-time and discrete-time systems, finite state machines, stateflow, timed and hybrid automata, concurrency, invariants, linear temporal logic, verification, and numerical simulation. Students are guided on methods for simulation and encouraged to apply them to several applications. The course is

self-contained. Students are expected to have a basic background in logic circuits, programming, the mathematical modeling of dynamical systems (ECE 8 is recommended), differential equations, linear algebra, and basic calculus. Knowledge of MATLAB/Simulink is useful. Students cannot receive credit for this course and ECE 249.

Prerequisite: Prerequisite(s): ECE 100 and ECE 100L or equivalent, and ECE 13 or CSE 13E or equivalent.

ECE 151 - Communications Systems (5)

An introduction to communication systems. Analysis and design of communication systems based on radio, transmission lines, and fiber optics. Topics include fundamentals of analog and digital signal transmission in the context of baseband communications, including concepts such as modulation and demodulation techniques, multiplexing and multiple access, channel loss, distortion, bandwidth, signal-to-noise ratios and error control. Digital communication concepts include an introduction to sampling and quantization, transmission coding and error control. (Formerly EE 151.)

Prerequisite: Prerequisite(s): ECE 103, ECE 101, and ECE 101L; and CSE 107 or STAT 131 or probability theory and random variables background. Enrollment is restricted to School of Engineering and Physical and Biological Sciences majors.

ECE 152 - Introduction to Wireless Communications (5)

Introduction to the principles of wireless communications systems. Wireless propagation channels and their impact on digital communications. Modulation techniques for wireless systems and their performance. Multi-antenna systems and diversity. Multicarrier and spread spectrum. Multi-access methods: FDMA, TDMA, CDMA. The structure of cellular systems. Students cannot receive credit for this course and course 252. (Formerly EE 152.)

Prerequisite: Prerequisite(s): CSE 107 and ECE 151, or by consent of instructor. Enrollment is restricted to juniors and seniors.

ECE 153 - Digital Signal Processing (5)

Introduction to the principles of signal processing, including discrete-time signals and systems, the z-transform, sampling of continuous-time signals, transform analysis of linear time-invariant systems, structures for discrete-time systems, the discrete Fourier transform, computation of the discrete Fourier transform, and filter design techniques. Taught in conjunction with Electrical Engineering 250. Students cannot receive credit for this course and Electrical Engineering 250. (Formerly EE 153 and CMPE 153.)

Prerequisite: Prerequisite(s): ECE 103. Enrollment is restricted to School of Engineering and Division of Physical and Biological Sciences majors or permission of instructor.

ECE 157 - RF Hardware Design (5)

Engineering design cycle for wireless and RF systems: design, practical hardware implementation, and prototype. (Formerly EE 157.)

Prerequisite: Prerequisite(s): ECE 101 and ECE 101L, ECE 103, and ECE 171, and ECE 174; or consent of instructor. Concurrent enrollment in ECE 157L is required.

ECE 157L - RF Hardware Design Laboratory (2)

Laboratory to accompany course 157, emphasizing hardware-design practice and principles applies to RF apparatus. Students design and implement a substantial final project during the last half of the course. Students are billed a materials fee. (Formerly EE 157L.)

Prerequisite: Prerequisite(s): ECE 101 and ECE 101L, ECE 103, and ECE 171, and ECE 174; or consent of instructor. Concurrent enrollment in ECE 157 is required.

ECE 163 - Introduction to Small-Scale UAV Theory and Practice (7)

Technologies involved in the modeling and simulation of small-scale unmanned aerial vehicles (UAVs) with an emphasis on control applications, from low-level flight stabilization to higher level path planning and vision-based control. Topics include coordinate frames, aerodynamics, equations of motion, full non-linear simulation, linearized dynamics models and trim states, force and moment balances for steady flight, flight controls by successive loop closure, state space control, path planning and guidance, sensors and estimation. Students enrolled in this class learn how to use the Python programming language to solve engineering problems. Taught in conjunction with ECE 263. Students cannot receive credit for this course and ECE 263.

Prerequisite: Prerequisite(s): ECE 141 or ECE 241 or ECE 242; and CSE 30 or ECE 13 or CSE 13E or CSE 13S. ECE 121, ECE 167, and ECE 145 recommended but not required. Enrollment is restricted to sophomores, juniors and seniors.

ECE 167 - Sensing and Sensor Technologies (7)

Introduces fundamental issues in sensing of temperature, motion, sound, light, position, etc. Sensors are integrated into a digital system using filtering, amplification, and analog-to-digital conversion. Advanced topics may include noise, temperature, and other sources of variability. Students who enrolled in this class will learn how to solve engineering problems using the C Programming Language.

Prerequisite: Prerequisite(s): CSE 13E or ECE 13; and ECE 103 and ECE 103L.

ECE 171 - Analog Electronics (5)

Introduction to (semiconductor) electronic devices. Conduction of electric currents in semiconductors, the semiconductor p-n junction, the transistor. Analysis and synthesis of linear and nonlinear electronic circuits containing diodes and transistors. Biasing, small signal models, frequency response, and feedback. Operational amplifiers and integrated circuits. (Formerly EE 171.)

Prerequisite: Prerequisite(s): ECE 101 and ECE 101L; previous or concurrent enrollment in ECE 171L is required.

ECE 171L - Analog Electronics Laboratory (2)

Laboratory sequence illustrating topics covered in course 171. One two-hour laboratory session per week.

Prerequisite: Prerequisite(s): ECE 101 and ECE 101L; previous or concurrent enrollment in ECE 171 is required.

ECE 172 - Advanced Analog Circuits (5)

Analog circuit design covering the basic amplifier configurations, current mirrors, differential amplifiers, frequency response, feedback amplifiers, noise, bandgap references, one- and two-stage operational amplifier design, feedback amplifier stability, switched capacitor circuits and optionally the fundamentals of digital-to-analog and analog-to-digital converters. Emphasis throughout will be on the development of approximate and intuitive methods for understanding and designing circuits. Cannot receive credit for this course and course 221. (Formerly EE 172.)

Prerequisite: Prerequisite(s): ECE 171.

ECE 173 - High-Speed Digital Design (7)

Studies of analog circuit principles relevant to high-speed digital design: signal propagation, crosstalk, and electromagnetic interference. Topics include electrical characteristics of digital circuits, interfacing different logic families, measurement techniques, distributed circuits and transmission lines, ground planes and grounding, terminations, power systems, electromagnetic compatibility and noise suppression. Laboratory sequence illustrates fundamental lecture topics and includes completion of a final design project.

Prerequisite: Prerequisite(s): ECE 101 and ECE 101L and ECE 174, or by permission of the instructor. ECE 171 and ECE 121 are recommended.

ECE 174 - Introduction to EDA Tools for PCB Design (3)

Focus on EDA tools for design of printed-circuit boards. Elements of design flow covered: schematic capture and simulation to final PCB layout. Final project is required. Students are billed a materials fee.

Prerequisite: Prerequisite(s): ECE 101 and ECE 101L or consent of instructor.

ECE 175 - Energy Generation and Control (5)

Introduces electrical energy generation, sensing, and control, emphasizing the emerging smart grid. Topics include 3-phase AC power systems, voltage and transient stability, fault analysis, grid protection, power-flow analysis, economic dispatch, and high voltage DC distribution (HVDC). (Formerly EE 175.)

Prerequisite: Prerequisite(s): ECE 101. Concurrent enrollment in ECE 175L is required.

ECE 175L - Energy Generation and Control Laboratory (2)

Computer analysis and simulation of energy generation, components, power-flow analysis, systems, and control covering topics from course 195. Weekly computer simulations

reinforce the concepts introduced in course 175. (Formerly EE 175L.)

Prerequisite: Prerequisite(s): ECE 101. Concurrent enrollment in ECE 175 is required.

ECE 176 - Energy Conservation and Control (5)

AC/DC electric-machine drives for speed/position control. Integrated discussion of electric machines, power electronics, and control systems. Computer simulations. Applications in electric transportation, hybrid-car technology, robotics, process control, and energy conservation. (Formerly EE 176.)

Prerequisite: Prerequisite(s): ECE 103 and ECE 171. Concurrent enrollment in ECE 176L is required.

ECE 176L - Energy Conversion and Control Laboratory (2)

Simulink-based simulations of electric machines/drives in applications such as energy conservation and motion control in robotics and electric vehicles. (Formerly EE 176L.)

Prerequisite: Prerequisite(s): ECE 103 and ECE 171. Concurrent enrollment in ECE 176 is required.

ECE 177 - Power Electronics (5)

Switch-mode power converter design and analysis. Non-switching power supplies. Electronic power-factor correction. Soft switching. Power-semiconductor devices. Use in energy conservation, renewable energy, lighting, and power transmission. (Formerly EE 177.)

Prerequisite: Prerequisite(s): ECE 103. Concurrent enrollment in ECE 177L is required.

ECE 177L - Power Electronics Laboratory (2)

Buck, boost, buck-boost, flyback, and forward converter design and control.

Prerequisite: Prerequisite(s): ECE 103. Concurrent enrollment in ECE 177 is required.

ECE 178 - Device Electronics (5)

This course reviews the fundamental principles, device's materials, and design and introduces the operation of several semiconductor devices. Topics include the motion of charge carriers in solids, equilibrium statistics, the electronic structure of solids, doping, the pn junction, the junction transistor, the Schottky diode, the field-effect transistor, the light-emitting diode, and the photodiode. (Formerly EE 178.)

Prerequisite: Prerequisite(s): ECE 102 and ECE 102L and ECE 171 and ECE 171L. Enrollment is restricted to School of Engineering and Division of Physical and Biological Sciences majors or permission of instructor.

ECE 179 - Decision Analysis in Management (5)

Presents decision tools/theory with a focus on investment, finance, management, technology, and policy. Often, irreversible decisions are made without enough information to analyze the possible consequences. Course uses systematic

approaches to analyze these types of situations to enable rational decisions. (CSE 174.)

Prerequisite: Prerequisite(s): AM 30 or MATH 22 or MATH 23A; and ECON 113; and ECON 100A or ECON 100M. Enrollment is restricted to juniors and seniors.

ECE 180J - Advanced Renewable Energy Sources, Storage, and Smart Grids (5)

Provides a comprehensive overview of renewable energy, storage, and smart grids. Fundamental energy-conversion limits based on physics and existing material properties are discussed. Various sources and facilities, such as solar, wind, hydropower, geothermal, tidal energy, and fuel cells are described. Solar- and wind-site assessment, electric vehicles, as well as sustainable microgrids are also discussed. Finally, the latest research on smart grids and smart cities is introduced. Taught in conjunction with course 80J. Students who enroll in this class will learn how to use Matlab to solve engineering problems.(Formerly EE 180J.)

Prerequisite: Prerequisite(s): MATH 3 or AM 3 or STAT 5 or STAT 7.

ECE 181J - Renewable Energy Sources in Practice (7)

Provides a fundamental understanding of renewable energies in practice by experiencing them in a functional context. Students visit and evaluate renewable-energy facilities, such as wind power, solar energy, hydrogen storage, biofuel production, waste-water testing facilities, biomass, biodiesel, and biogas. This intensive one-month program allows students to carry out applied research in a real-life, industrial-scale, renewable-energy context. Prerequisite(s): course 80J or equivalent. Enrollment restricted to junior, senior, and graduate students and by permission of instructor. (Formerly EE 181J.)

ECE 183 - Special Topics in Electrical Engineering (5)

Topics vary with instructor. Sample topics include smart grids, bioelectronics, antennas, etc. Enrollment by instructor permission. Approval of undergraduate adviser required for credit as an upper-division elective. (Formerly EE 183.)

ECE 193 - Field Study (5)

Provides for individual programs of study with specific academic objectives carried out under the direction of a faculty member of the electrical engineering program and a willing sponsor at the field site and using resources not normally available on campus. Credit is based on the presentation of evidence of achieving the objectives by submitting a written and oral presentation. May not normally be repeated for credit.

ECE 193F - Field Study (2)

Provides for individual programs of study with specific academic objectives carried out under the direction of a faculty member of the electrical engineering program and a willing sponsor at the field site and using resources not normally available on campus. Credit is based on the presentation of evidence of achieving the objectives by submitting a written and oral presentation. May not normally be repeated for credit.

ECE 195 - Senior Thesis Research (5)

Individual directed study for upper-division undergraduates. Students submit petition to sponsoring agency. If using this course to replace the capstone design requirement (courses 129A,B,C), students must take course 129A, and take course 115 or 157 or Computer Engineering 118 to fulfill the ABET team design experience. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

ECE 195F - Senior Thesis Research (2)

Prerequisite(s): petition on file with sponsoring agency. Students submit petition to sponsoring agency.

ECE 198 - Individual Study or Research (5)

Provides for department-sponsored individual study program off campus, for which faculty supervision is not in person, but by correspondence. Students submit petition to sponsoring agency.

ECE 198F - Independent Field Study (2)

Provides for department-sponsored individual study program off campus for which faculty supervision is not in person, but by correspondence. Students submit petition to sponsoring agency.

ECE 199 - Tutorial (5)

Individual directed study for upper-division undergraduates. Students submit petition to sponsoring agency.

ECE 199F - Tutorial (2)

Individual directed study for upper-division undergraduates. Students submit petition to sponsoring agency.

Graduate**ECE 200 - Research and Teaching in Electrical Engineering (3)**

Basic teaching techniques for TAs: responsibilities and rights, resource materials, computer security, leading discussion or lab sessions, presentations techniques, maintaining class records, electronic handling of homework, and grading. Examines research and professional training; use of library and online databases, technical typesetting, writing journal and conference papers, publishing, giving talks, and ethical issues. (Formerly EE 200.)

Prerequisite: Enrollment is restricted to graduate students.

ECE 201 - Introduction to Nanotechnology (5)

Introduction to underlying principles of nanoscience and nanotechnology. Intended for multidisciplinary audience with a variety of backgrounds. Introduces scientific principles and laws relevant on the nanoscale. Discusses applications in engineering, physics, chemistry, and biology. (Formerly EE 211.)

Prerequisite: Prerequisite(s): ECE 102 or consent of instructor.

ECE 203 - Nanocharacterization of Materials (5)

Covers the many characterization techniques used to characterize materials from volumes less than one cubic micrometer, including the basic physics of each method, the methodology used to get quantitative results, and the advantages and limitations of each technique. (Formerly EE 213.)

Prerequisite: Enrollment restricted to graduate students, or to undergraduates majoring in engineering or science by permission of instructor.

ECE 204 - Bioelectronics (5)

Covers selected case studies in interfacing electronic devices with biological systems from Galvani to neuronal stimulation and electroceuticals. Studies include: the squid giant axon, the pacemaker, deep-brain stimulation, organic bioelectronics, bionanoelectronics and optogenetics, bioenergetics, and bioprotonics electroceuticals. Students are assessed through weekly papers on case studies and through a final presentation. (Formerly EE 204.)

Prerequisite: Enrollment is restricted to graduate students.

ECE 205 - Fundamentals of Nanoelectronics (5)

Covers microscopic theory of electron transport in nanoelectronic devices and transistors. Topics include: ballistic transport; quantum conductance, NEGF-Landauer formalisms; molecular conductors; graphene and carbon nanotubes, quantum resonant tunneling devices; nanotransistors; and spintronics. (Formerly EE 218.)

Prerequisite: Prerequisite(s): ECE 201 or ECE 207. Enrollment is restricted to graduate students. Students with background in basic matrix algebra and MATLAB programming may enroll with permission of instructor.

ECE 207 - Nanomaterials and Nanometer-Scale Devices (5)

Materials controlled at nanometer-scale will revolutionize existing technologies. Course offers opportunities of learning materials that exhibit peculiar physical characteristics at the nanometer scales. Course also includes discussions of unique device architecture based on materials crafted at the nanometer scale. (Formerly EE 216.)

ECE 215 - Models of Robotic Manipulation (5)

Theory and application of mathematical models to analyze, design, and program serial kinematic chains (robot arms). Covers models of arbitrary articulated robotic or biological arms and their application to realistic arms and tasks, including the homogeneous coordinate model of positioning tasks; the forward and inverse kinematic models; the Jacobian matrix; trajectory generation; and dynamic models, including Newton-Euler and Lagrangian formulations. (Formerly CMPE 215.)

Prerequisite: Enrollment is restricted to graduate students; and to seniors who have taken ECE 141, and AM 10 or MATH 21; or by permission of instructor.

ECE 216 - Bio-Inspired Locomotion (5)

Presents the principles of biological locomotion and application to robotics problems. Students learn about effective movements in the biological world (slithering, walking, climbing, and flying); extract their underlying principles; and apply them creatively to robotics design. (Formerly CMPE 216.)

Prerequisite: Prerequisite(s): ECE 9 or equivalent. Enrollment is restricted to graduate students, and seniors by permission of instructor.

ECE 218 - Mechatronics (10)

Examines technologies involved in mechatronics (intelligent electro-mechanical systems) and techniques necessary to integrate these technologies. Topics include electronics (A/D, D/A converters, opamps, filters, power devices), software program design (event-driven programming, state machine-based design), DC and stepper motors, basic sensing, and basic mechanical design (machine elements and mechanical CAD). Students learn how to solve engineering problems using C Programming Language. Combines lab component of structured assignments with a large and open-ended team project. Students cannot receive credit for this course and ECE 118.

Prerequisite: Prerequisite(s): Enrollment is restricted to graduate students.

ECE 221 - Advanced Analog Integrated Circuits (5)

Analog integrated circuit design with emphasis on fundamentals of designing linear circuits using CMOS. Covers MOS devices and device modeling, current mirrors, op-amp design, op-amp compensation, comparators, multipliers, voltage references, sample-and-holds, noise, and an introduction to more complicated systems using these building blocks, such as phase locked loops and analog-to-digital converters. If time permits, integrated circuit layout issues and device/circuit fabrication. Students cannot receive credit for this course and ECE 172. (Formerly EE 221.)

Prerequisite: Prerequisite(s): course ECE 171 or equivalent; ECE 178 or equivalent recommended.

ECE 222 - High-Speed Low-Power Integrated Circuit Design (5)

Digital integrated circuit design covered with an emphasis on high-speed and low-power applications. Covers signaling techniques and circuits including transmitters and receivers, with emphasis on on-chip interconnect, timing fundamentals and timing circuits. Theoretical fundamentals of phase locked loops and design issues of implementation addressed. Course has a project design component. Interview to assess technical skills of student. Enrollment is restricted to electrical engineering and computer engineering graduate students. (Formerly EE 222.)

ECE 223 - Advanced Solid-State Devices (5)

Solid-state devices advance rapidly by employing new materials, new architecture, and new functional principles. Class offers opportunities to learn the latest advancements in

solid-state devices (e.g., electronic, optoelectronic, photonic devices, and smart sensors) viewed from various scientific, technological, and engineering aspects, such as energy conversion and computation. (Formerly EE 223.)

ECE 224 - Device Electronics (5)

Reviews the fundamentals of semiconductors and then explores the structure, design, and operation of the most important and widely used semiconductor devices. Topics include the motion of charge carriers in solids, equilibrium statistics, the electronic structure of solids, doping, the pn junction, the junction transistor, the Schottky diode, field-effect transistor, the light-emitting diode, and the photodiode.

Prerequisite: Enrollment is restricted to graduate students.

ECE 225 - Semiconductor Processing and Bandgap Engineering (5)

Addresses principles of semiconductor processing with applications for semiconductor materials engineering, research, and development. The materials fabrication and processing topics include preparation of silicon, III-V compounds, and dielectric thin films, including thin film deposition techniques, diffusion, ion implantation, and standard device fabrication sequences. Applications of these processing principles for semiconductor materials engineering and bandgap engineering in semiconductor heterostructures are discussed for devices, such as LEDs, lasers, photoreceptors, modulators, and high-speed transistors.

Prerequisite: Enrollment is restricted to graduate students.

ECE 226 - CMOS Radio Frequency Integrated Circuit Design (5)

Covers narrowband and high-frequency techniques, noise, distortion, nonlinearities, low-noise amplifiers, power amplifiers, mixers, receivers, and transmitters for wireless communications. Topics are presented in the context of integrated designs in CMOS, but topics are fundamental and widely applicable. (Formerly EE 226.)

Prerequisite: Prerequisite(s): ECE 172 or ECE 221 or permission of instructor.

ECE 227 - Fundamentals of Semiconductor Physics (5)

Semiconductor physics is examined for advanced new materials and devices. Discusses how familiar concepts are extended to new electronics. Intended for students interested in electrical engineering, physics, and materials science applications. Good familiarity with basic electromagnetism and quantum physics is assumed. (Formerly EE 227.)

Prerequisite: Enrollment is restricted to graduate students.

ECE 228 - Engineering of Thin Film Deposition (5)

Covers key processes to build a coherent picture of the deposition of thin films. Offers an opportunity to implement general computing resources in describing the formation of thin films. The deposition of thin films plays a key role in technology due to their unprecedented physical properties. Their deposition depends on such factors as thermodynamics in

the deposition environment and kinetics on the solid surfaces where atoms are assembled; therefore, understanding the fundamental processes involved is important. (Formerly EE 217.)

Prerequisite: Students should have a background in solid-state materials that is equivalent to ECE 102. Enrollment is restricted to graduate students.

ECE 229 - Quantum Electronics (5)

Covers basic theory of interaction of electromagnetic radiation with resonant atomic transitions and density matrix treatment; and applications including Rabi oscillations, slow light; nonlinear optics; coherent radiation, and noise in photodetectors and lasers. (Formerly EE 232.)

Prerequisite: Prerequisite(s): ECE 231 or equivalent.

ECE 230 - Optical Fiber Communication (5)

Components and system design of optical fiber communication. Topics include step-index fibers, graded-index fibers, fiber modes, single-mode fibers, multimode fibers, dispersion, loss mechanics, fiber fabrication, light-emission processes in semiconductors, light-emitting diodes, laser diodes, modulation response, source-fiber coupling, photodetectors, receivers, receiver noise and sensitivity, system design, power budget and rise-time budget, fiber-optic networks (FDDI, SONET, etc.), wavelength division multiplexing (WDM). Students cannot receive credit for this course and ECE 130. (Formerly EE 230.)

Prerequisite: Enrollment is restricted to graduate students.

ECE 231 - Optical Electronics (5)

Introduction to phenomena, devices, and applications of optoelectronics. Main emphasis is on optical properties of semiconductors and semiconductor lasers. (Formerly EE 231.)

Prerequisite: Prerequisite(s): ECE 102 and ECE 102L.

ECE 232 - Integrated Biophotonics (5)

Covers use of integrated optics for study of biological material; fluorescence spectroscopy, single molecule detection, optical tweezers, layered dielectric media, hollow-core waveguides, photonic crystals, optofluidics, biophotonic systems, and applications. (Formerly EE 236.)

Prerequisite: Prerequisite(s): ECE 233 or equivalent. Enrollment is restricted to graduate students.

ECE 236 - Optics and Microscopy (5)

Covers the basic principles of optics and microscopy. Topics include geometrical optics, simple ray tracing, diffraction, Fourier optics, image formation in the human eye, the photographic camera, and different types of microscopes. Hands-on experience is provided in laboratories. Requires basic mathematics. (Formerly EE 266.)

Prerequisite: Enrollment is restricted to graduate students. Undergraduate students may enroll with permission of the instructor.

ECE 237 - Image Processing and Reconstruction (5)

Fundamental concepts in digital image processing and reconstruction. Continuous and discrete images; image acquisition, sampling. Linear transformations of images, convolution and superposition. Image enhancement and restoration, spatial and spectral filtering. Temporal image processing: change detection, image registration, motion estimation. Image reconstruction from incomplete data. Applications. (Formerly EE 264.)

Prerequisite: Prerequisite(s): ECE 153 or permission of instructor.

ECE 240 - Introduction to Linear Dynamical Systems (5)

Introduction to applied linear algebra and linear dynamical systems with applications to circuits, signal processing, communications, and control systems. Topics include the following: Least-squares approximations of over-determined equations and least-norm solutions of underdetermined equations. Symmetric matrices, matrix norm and singular value decomposition. Eigenvalues, left and right eigenvectors, and dynamical interpretation. Matrix exponential, stability, and asymptotic behavior. Multi-input multi-output systems, impulse and step matrices; convolution and transfer matrix descriptions. Control, reachability, state transfer, and least-norm inputs. Observability and least-squares state estimation. (Formerly CMPE 240.)

Prerequisite: Enrollment is restricted to graduate students; undergraduates may enroll if they have completed ECE 103 and AM 147.

ECE 241 - Introduction to Feedback Control Systems (5)

Graduate-level introduction to control of continuous linear systems using classical feedback techniques. Design of feedback controllers for command-following error, disturbance rejection, stability, and dynamic response specifications. Root locus and frequency response design techniques. Extensive use of Matlab for computer-aided controller design. Course has concurrent lectures with ECE 141.

Prerequisite: Enrollment is restricted to graduate students.

ECE 242 - Applied Feedback Control (5)

Sequel to Electrical Engineering 154. After reviewing control design techniques examined in EE 154, this course explores state space control, discrete time control, and two case studies in control design. Students design and implement feedback controllers on an inverted pendulum experiment. (Formerly CMPE 242.)

Prerequisite: Prerequisite(s): ECE 141 or ECE 241. Enrollment is restricted to juniors, seniors, and graduate students.

ECE 243 - System Identification (5)

Course provides introduction to the construction of linear dynamical models from experimental data using parametric and non-parametric identification techniques. Theoretical and practical aspects of these techniques addressed. (Formerly CMPE 243.)

Prerequisite: Prerequisite(s): ECE 240, or by permission of instructor.

ECE 244 - Digital Control (5)

Teaches the design and analysis of digital control systems. The topics covered are discrete-time system modeling; z-transform; stability, controllability, and observability of discrete-time systems; various design approaches to control design in which sensor, computer hardware, actuation, communication, and user interface are part of the design. Note: knowledge of linear algebra, calculus, basic differential equations, Laplace transform, signals and systems, linear-system control theory, MATLAB, and the use of word-processing software are assumed. (Formerly CMPE 244.)

Prerequisite: Prerequisite(s): ECE 141 or ECE 241. Enrollment is restricted to graduate students, or by permission of the instructor.

ECE 245 - Estimation and Introduction to Control of Stochastic Processes (5)

Provides practical knowledge of Kalman filtering and introduces control theory for stochastic processes. Selected topics include: state-space modeling; discrete- and continuous-time Kalman filter; smoothing; and applications in feedback control. Students learn through hands-on experience. Students cannot receive credit for this course and course 145. (Formerly CMPE 245.)

Prerequisite: Prerequisite(s): ECE 240 or ECE 241. Knowledge of Matlab is expected. Enrollment is restricted to graduate students.

ECE 246 - Hybrid Dynamical Systems (5)

Examines the modeling and analysis of hybrid dynamical systems, including the modeling of hybrid systems, the concept of solutions, Zeno behavior, equilibrium sets, stability, convergence, Lyapunov-based conditions, robustness, and simulation. Students are guided on methods for simulation and encouraged to apply them to several applications. (Formerly CMPE 246.)

Prerequisite: Prerequisite(s): ECE 241. Enrollment is restricted to graduate students.

ECE 249 - Introduction to Cyber-physical Systems (5)

Presents the basic concepts and tools for the study of cyber-physical systems, including modeling and analysis tools for continuous-time and discrete-time systems, finite state machines, stateflow, timed and hybrid automata, concurrency, invariants, linear temporal logic, verification, and numerical simulation. Students are guided on methods for simulation and encouraged to apply them to several applications. The course is self-contained. Students are expected to have a basic background in logic circuits, programming, the mathematical modeling of dynamical systems (ECE 8 is recommended), differential equations, linear algebra, and basic calculus. Knowledge of MATLAB/Simulink is useful. Students cannot receive credit for this course and ECE 149.

Prerequisite: Prerequisite(s): CSE 100 and CSE 100L or equivalent, and ECE 13 or CSE 13E or equivalent.

ECE 250 - Digital Signal Processing (5)

In-depth study of signal processing techniques, including discrete-time signals and systems, the z-transform, sampling of continuous-time signals, transform analysis of linear time-invariant systems, structures for discrete-time systems, the discrete Fourier transform, computation of the discrete Fourier transform, filter design techniques. Students cannot receive credit for this course and course 153. (Formerly EE 250.)

ECE 251 - Principles of Digital Communications (5)

A core course on digital communications theory. Provides an introduction to digital communication, including source coding, characterization of communication signals and systems, modulation and demodulation for the additive Gaussian channel, digital signaling, and over bandwidth constrained linear filter channels and over fading multipath channels. (Formerly EE 251.)

Prerequisite: Prerequisite(s): ECE 151 and ECE 153 and CSE 107.

ECE 252 - Wireless Communications (5)

In-depth study of the physical layer of wireless communications. Wireless propagation channels and their impact on digital communications. Modulation techniques for wireless systems and their performance. Multi-antenna systems and diversity. Multicarrier and spread spectrum. Multi-access methods: FDMA, TDMA, CDMA. The structure of cellular systems. Students cannot receive credit for this course and course 152. (Formerly EE 252.)

Prerequisite: Prerequisite(s): ECE 251.

ECE 253 - Introduction to Information Theory (5)

An introduction to information theory including topics such as entropy, relative entropy, mutual information, asymptotic equipartition property, channel capacity, differential entropy, rate distortion theory, and universal source coding. (Formerly EE 253 and CMPS 250.)

Prerequisite: Enrollment is restricted to graduate students.

ECE 254 - Radar, Synthetic Aperture Radar, and ISAR (5)

Introduces radar signal processing, synthetic aperture radar (SAR), and inverse SAR (ISAR). Focuses on the fundamentals and design principles of modern radar systems. Students use hands-on computer simulations to build a strong background in radar sensor systems that can be applied to a variety of problems, such as medical imaging, ground-penetrating radar imaging for geophysical exploration, and the use of radar sensor systems for satellite-based SAR. (Formerly EE 288.)

Prerequisite: Prerequisite(s): ECE 153. Enrollment is restricted to juniors, seniors, and graduate students.

ECE 255 - Error Control Coding (5)

Covers the following topics: introduction to algebra; linear block code; cyclic codes; BCH code; RS codes; spectral domain study of codes; CRC; and product codes. (Formerly EE 261.)

ECE 256 - Statistical Signal Processing (5)

Covers fundamental approaches to designing optimal estimators and detectors of deterministic and random parameters and processes in noise, and includes analysis of their performance. Binary hypothesis testing: the Neyman-Pearson Theorem. Receiver operating characteristics. Deterministic versus random signals. Detection with unknown parameters. Optimal estimation of the unknown parameters: least square, maximum likelihood, Bayesian estimation. Will review the fundamental mathematical and statistical techniques employed. Many applications of the techniques are presented throughout the course. Note: While a review of probability and statistics is provided, this is not a basic course on this material. (Formerly EE 262.)

Prerequisite: Prerequisite(s): ECE 103 and CSE 107, or permission of instructor.

ECE 258 - Introduction to Inverse Problems (3)

Fundamental approaches and techniques in solving inverse problems in engineering and applied sciences, particularly in imaging. Initial emphasis on fundamental mathematical, numerical, and statistical formulations and known solution methods. Sampling of applications presented from diverse set of areas (astronomical, medical and optical imaging, and geophysical exploration). (Formerly EE 265.)

Prerequisite: Enrollment is restricted to graduate students.

ECE 263 - Small-Scale UAV Theory and Practice (7)

Technologies involved in the modeling and simulation of small-scale unmanned aerial vehicles (UAVs) with an emphasis on control applications, from low-level flight stabilization to higher level path planning and vision-based control. Topics include coordinate frames, aerodynamics, equations of motion, full non-linear simulation, linearized dynamics models and trim states, force and moment balances for steady flight, flight controls by successive loop closure, state space control, path planning and guidance, sensors and estimation. Students enrolled in this class learn how to use the Python programming language to solve engineering problems. Students gain team leadership and project management skills. Taught in conjunction with ECE 163. Students cannot receive credit for this course and ECE 163.

Prerequisite: Prerequisites: Students should have an understanding of Feedback Controls and Programming (Python preferred). It is recommended but not required that students have a background in Sensors, Microcontrollers, Kalman Filtering, and Estimation. Enrollment is restricted to graduate students.

ECE 275 - Energy Market, Policy, and Modeling (5)

The power industry is responsible for a large fraction of the U.S.'s emissions of SO₂, NO_x, and CO₂, as well as much other

water, solid waste, and land impacts. Its large environmental as well as economic footprint make it a target of many environmental policies, as well as an inherently interesting sector to study. The recent development of energy and climate policy at the global, the U.S. federal, and state-level has made Energy & Climate Policy an intriguing and dynamic topic for both industries and academia. This course will present fundamental analytical tools (optimization and simulation) for modeling firm and market behavior for the energy sector, with a focus on electric power. However, these models can be used for planning investments in generation, transmission, and energy conservation, and for analysis of public policy.

Prerequisite: Enrollment is restricted to graduate students.

ECE 279 - Optimization and Control for Electric Power Systems (5)

Provides a comprehensive overview of power systems. Students learn how mathematical tools are used for the system planning and operation. Advanced topics include smart grids, electric vehicles and energy data analytics.

Prerequisite: Enrollment is restricted to graduate students. Undergraduates admitted with permission of the instructor.

ECE 280A - Current Topics in Applied Microscopy and Neuronal Imaging (2)

A weekly seminar to discuss current topics in applied microscopy and neuronal imaging. (Formerly EE 280A.)

Prerequisite: Enrollment is restricted to graduate students.

ECE 280B - Seminar on Integrated Bioelectronics (2)

Weekly seminar covering current research in integrated bioelectronics. Enrollment is by permission of the instructor and is restricted to students who have research in bioelectronics. (Formerly EE 280B.)

ECE 280C - Seminar on Control (2)

Weekly seminar series covering topics of current research in theory and application of control to engineering systems. Current research work and literature in these areas discussed. (Formerly CMPE 280C.)

Prerequisite: Enrollment is restricted to graduate students; undergraduates may enroll with permission of instructor.

ECE 280D - Graduate Research Seminar (2)

Weekly seminar series in topics of current research in information systems and technology management. Enrollment by permission of instructor. (Formerly TIM 280A.)

ECE 280N - Seminar on Nanophotonics and Lab-on-Chip Systems (2)

Weekly series covering current research in nanophotonics and lab-on-chip systems including nanoplasmonic biosensors; nanospectroscopy (Raman and vibrational mid-infrared spectroscopy); nanofabrication; nanophotonics devices for energy conversion and thermoplasmonics; acoustic fluids; and microfluidic integration. Current research work and recent

literature are discussed. Enrollment is by permission of the instructor and restricted to graduate students. Sophomores, juniors, and seniors may enroll by permission of instructor. (Formerly EE 280N.)

ECE 280O - Seminar on Applied Optics (2)

Weekly seminar series covering topics of current research in applied optics, including integrated, quantum, nonlinear, and nano-optics. Current research work and literature in these areas are discussed. Enrollment by permission of instructor. (Formerly EE 280O.)

ECE 280Z - Seminar on Smart Grids and Data Analytics (2)

Weekly series covering state-of-the-art research in smart power grids, machine learning, communications, and signal processing. Current research works and recent literature are discussed. Enrollment is by permission of the instructor and is restricted to graduate students. Undergraduates may enroll by permission of the instructor. (Formerly EE 280Z.)

ECE 283 - Special Topics in Electrical and Computer Engineering (3)

Graduate seminar on a research topic in electrical engineering that varies with the particular instructor. Topics may include, but are not limited to, electromagnetics, antennas, electronics biotechnology, nanotechnology, signal processing, communications, VLSI, MEMS, and radio frequency. Enrollment is restricted to graduate students and consent of instructor. (Formerly EE 283.)

ECE 290 - ECE Graduate Seminar (2)

Leading speakers from academia and industry present their latest research.

Prerequisite: Enrollment is restricted to computer engineering, electrical engineering, and electrical and computer engineering graduate students.

ECE 291 - Tomorrow's Professors, Engineers, and Entrepreneurs (3)

The aim of this course is two-fold: (1) inform, motivate, and prepare graduate students for possible careers in academia and industry; (2) expose graduate students to the professional skills required for possible career options in engineering and science. Course is for Satisfactory/Unsatisfactory grade only. (Formerly EE 291, Tomorrow's Professors, Engineers, and Entrepreneurs.)

Prerequisite: Enrollment is restricted to graduate students.

ECE 293 - Advanced Topics in Electrical and Computer Engineering (5)

Graduate seminar on a research topic in electrical engineering that varies with the particular instructor. Typical topics include, but are not limited to, electromagnetics, antennas, electronics biotechnology, nanotechnology, signal processing, communications, VLSI, and MEMS.

Prerequisite(s): Enrollment is by permission of the instructor and is restricted to graduate students. In some quarters course will be taught in conjunction with ECE 183. (Formerly EE 293.)

ECE 296 - Master Project (5)

Master project conducted under faculty supervision. Petition on file with sponsor faculty.

ECE 297A - Independent Study or Research (5)

Independent study or research under faculty supervision. Students submit petition to sponsoring agency.

ECE 297B - Independent Study or Research (10)

Independent study or research under faculty supervision. Students submit petition to sponsoring agency.

ECE 297C - Independent Study or Research (15)

Independent study or research under faculty supervision. Students submit petition to sponsoring agency.

ECE 297F - Independent Study or Research (2)

Independent study or research under faculty supervision. Students submit petition to sponsoring agency.

ECE 299A - Thesis Research (5)

Thesis research conducted under faculty supervision. Students submit petition to sponsoring agency.

ECE 299B - Thesis Research (10)

Thesis research conducted under faculty supervision. Students submit petition to sponsoring agency.

ECE 299C - Thesis Research (15)

Thesis research conducted under faculty supervision. Students submit petition to sponsoring agency.

ECON - ECONOMICS

Lower-Division

ECON 1 - Introductory Microeconomics: Resource Allocation and Market Structure (5)

For all interested students as well as prospective economics majors. Examines how markets allocate resources in different kinds of economies. Topics include competitive markets, monopoly, financial markets, income distribution, market failures, the environment, and the role of government.

ECON 2 - Introductory Macroeconomics: Aggregate Economic Activity (5)

For all interested students and prospective economics majors. Examines how the overall level of national economic activity is determined, including output, employment, and inflation. Explores the roles of monetary and fiscal policies in stabilizing the economy and promoting growth, with a focus on contemporary policy debates.

ECON 10A - Economics of Accounting (5)

Introduces students to fundamental accounting principles and practices. Key topics include reviewing the accounting cycle,

preparing basic financial statements, and integrating data analysis tools to interpret and analyze financial statement data. Course improves students' financial literacy skills by illustrating how financial statements are used by external parties such as bankers, creditors, investors, and others who have a desire and/or need to learn more about the financial information of business organizations.

ECON 10B - Economics of Accounting (5)

Foundation of accounting course providing students with the concepts, practices, and tools for analyzing, planning, and making managerial accounting decisions for the future with an emphasis on performance measurement using various data analysis tools. Key topics include product and service costing, management decision-making and analysis, planning and controlling processes, CVP analysis, budgeting, variance analysis, and segment reporting.

Prerequisite: Prerequisite(s): ECON 10A.

ECON 20 - Economics for Non-Majors (5)

Designed for non-majors seeking a basic introduction to core economic concepts relevant for social and public policy decision making. Fundamental economic concepts illustrated through their application to a variety of public policy questions.

ECON 30 - Introduction to Entrepreneurship (5)

Provides an overview of the role and importance of entrepreneurship in the economy and society; a framework for approaching entrepreneurship and innovation; and exposure to the core competencies required of all entrepreneurs. The course incorporates case studies and speakers (often actual entrepreneurs) to provide context for the entrepreneurial topics covered in the course.

ECON 93 - Field Study (5)

Supervised fieldwork experience in an area connected with economics or business. Prerequisite(s): two of the following ECON 100A, ECON 100B, ECON 113. Enrollment restricted to juniors and seniors. Students submit petition to sponsoring agency and seek internship for approval by agency.

ECON 93F - Field Study (2)

Supervised fieldwork experience, in an area connected with economics or business. Prerequisite(s): two of the following ECON 100A, ECON 100B, ECON 113. Enrollment restricted to juniors and seniors. Students submit petition to sponsoring agency and seek internship for approval by agency.

ECON 99 - Tutorial (5)

Upper-Division

ECON 100A - Intermediate Microeconomics (5)

Covers major theoretical issues arising in the study of resource allocation, the function of markets, consumer behavior, and the determination of price, output, and profits in competitive, monopolistic, and oligopolistic market structures. Also

considers issues of welfare and public policy. Students cannot receive credit for this course and course 100M.

Prerequisite: Prerequisite(s): ECON 1 and ECON 2; and ECON 11B or AM 11B or MATH 22 or MATH 23A.

ECON 100B - Intermediate Macroeconomics (5)

Covers major theoretical issues arising in the study of income, employment, interest rates, and the price level. Examines the role of monetary and fiscal policy in economic stabilization. Also considers these issues as they relate to the global economy. Students cannot receive credit for this course and course 100N.

Prerequisite: Prerequisite(s): ECON 1 and ECON 2; and ECON 11B or AM 11B or MATH 22 or MATH 23A.

ECON 100M - Intermediate Microeconomics, Math Intensive (5)

Mathematically sophisticated version of course 100A. Provides analytically rigorous treatment of the subject using a calculus-intensive presentation of microeconomic theory. For specific topics, see course 100A. Students cannot receive credit for this course and course 100A.

Prerequisite: Prerequisite(s): ECON 1 and ECON 2; and ECON 11B or AM 11B or MATH 22 or MATH 23A.

ECON 100N - Intermediate Macroeconomics, Math Intensive (5)

Provides rigorous, mathematical-intensive treatment of topics covered in course 100B. Core is devoted to model-based analysis of questions in macroeconomics. Use of mathematical tools allows study of advanced topics and data-intensive applications. See course 100B for specific topics. Students cannot receive credit for this course and course 100B.

Prerequisite: Prerequisite(s): ECON 1 and ECON 2; and ECON 11B or AM 11B or MATH 22 or MATH 23A.

ECON 101 - Managerial Economics (5)

Analysis of the theory and practice of decision making in business firms, applying the concepts and techniques of microeconomics. Topics may include pricing schemes, non-price competition, internal organization of firms, incentive contracts, asymmetric information, and game theory. Case studies are used to illustrate some topics.

Prerequisite: Prerequisite(s): ECON 100A or ECON 100M; and ECON 113.

ECON 104 - Is There Truth in Numbers: The Role of Statistics in Economics (5)

Applies the techniques of econometrics and experimental economics to the understanding of economics. A hands-on course where real economic data is used in an interactive way so that students develop the art of empirical analysis.

Prerequisite: Prerequisite(s): ECON 100A or ECON 100M; and ECON 113, and Entry Level Writing and Composition requirements.

ECON 105 - Topics in Macroeconomics (5)

Covers topics in macroeconomics. Course builds on the tools of macroeconomics developed in ECON 100B and ECON 100N to explore topical macroeconomic issues. Possible topics include economic growth, business cycles, financial crises, unemployment, inflation, inequality, and the global economy.

Prerequisite: Prerequisite(s): ECON 100B or ECON 100N; and ECON 113.

ECON 110 - Managerial Cost Accounting and Control (5)

Focuses on how cost data are used by managers in the planning and control of both private- and public-sector organizations. Specific topics include organization of the management and control function, use of cost data for the pricing of goods and services, the effect of cost systems on management performance, and capital budgeting.

Prerequisite: Prerequisite(s): ECON 10B.

ECON 111A - Intermediate Accounting I (5)

Principles, control, and theory of accounting for assets; accounting as an information system; measurement and determination of income. Projects involving spreadsheet software are required.

Prerequisite: Prerequisite(s): ECON 10B.

ECON 111B - Intermediate Accounting II (5)

Covers the principles, control, the theory of accounting for liabilities and property; plant and equipment, the preparation and analysis of investments, and review and analysis of bonds and leases.

Prerequisite: Prerequisite(s): ECON 111A..

ECON 111C - Intermediate Accounting III (5)

Covers the principles of control, the theory of accounting for pensions and income taxes; the determination of share-based compensation and earnings per share, the calculation of shareholder's equity, and advanced topics in intermediate accounting.

Prerequisite: Prerequisite(s): ECON 111A.

ECON 112 - Auditing and Attestation (5)

For business management economics majors interested in careers that emphasize accounting, finance, or technology management. Also for students who intend to take the CPA exam. Covers audit techniques, risk analysis, and development of control structures for major financial processes including cash, investments, accounts receivable, inventories, accounts payable, debt, equity capital, and related information systems security.

Prerequisite: Prerequisite(s): ECON 10B.

ECON 113 - Introduction to Econometrics (5)

Practical methods for organizing and analyzing economic data, testing economic hypotheses, and measuring economic

relationships. Regression analysis is the main empirical method, and basic statistical and probability theory is included. Students gain hands-on computer experience with an econometric software package.

Prerequisite: Prerequisite(s): ECON 1 and ECON 2; STAT 7 and STAT 7L; and one of the following: ECON 11B, AM 11B, MATH 22, or MATH 23A. ECON 100A or ECON 100B strongly recommended as preparation.

ECON 114 - Advanced Quantitative Methods (5)

Application of statistical methods to estimating and testing economic relationships, i.e., econometric techniques. Topics include the effects of misspecification, choice of functional form, serial correlation, heteroscedasticity, limited dependent variables, and simultaneous equations. Includes discussion of existing empirical work and econometric projects by students.

Prerequisite: Prerequisite(s): ECON 100A or ECON 100M, and ECON 113; concurrent enrollment in ECON 114L is required.

ECON 114L - Advanced Quantitative Methods Lab (2)

Laboratory component associated with course 114. Topics include learning the fundamentals of programming in R language and learning to implement the modes and methods taught in course 114 lectures.

Prerequisite: Prerequisite(s): ECON 100A or ECON 100M; and ECON 113; concurrent enrollment in ECON 114 is required.

ECON 115 - Introduction to Management Sciences (5)

The scientific study of management decision making. Topics include linear, integer, and non-linear programming. Special emphasis on a wide variety of practical applications, including production scheduling, optimal transportation assignments, and optimal inventory policy.

Prerequisite: Prerequisite(s): ECON 100A or ECON 100M.

ECON 116 - Advanced Topics in Accounting and Ethics (5)

Covers topics in accounting and ethics. Builds a strong accounting foundation; develops critical thinking skills; and explores ethical standards in accounting, forensic accounting, international financial recording standards, and accounting for sustainability. Meets the California state educational ethics requirement for certified public accountant (CPA) licensure.

Prerequisite: Prerequisite(s): ECON 111A and ECON 111B. Enrollment is restricted to economics, business management economics, global economics, and the combined economics and environmental studies and mathematics majors.

ECON 117A - Income Tax Factors for Individuals (5)

Introduces federal taxation for individuals. Topics for study include taxable income, gross income exclusions and inclusions, capital gains, depreciation, business and itemized deductions, personal and dependency exemptions, passive activity losses, tax credits, and methods of accounting.

Prerequisite: Prerequisite(s): ECON 10A.

ECON 117B - Tax Factors of Business and Investment (5)

Focuses on various tax subjects providing a strong foundation in tax concepts and preparation for work in either public or corporate accounting. Topics include historical perspective of the U.S. tax system, introduction to estate and gift taxes, employment and self-employment taxes, tax concepts and laws, business expenses, capital recovery, tax credits, capital gains and losses, capital investments, and corporate operations.

Prerequisite: Prerequisite(s): ECON 10B.

ECON 119 - Advanced Accounting (5)

Accounting for business organizations; partnerships; government and non-profit organization funds; branches, consolidations, and installment sales. Projects involving spreadsheet software required.

Prerequisite: Prerequisite(s): ECON 111A or ECON 111B.

ECON 120 - Development Economics (5)

Studies the microeconomics of development. Topics may include health and nutrition, education, intra-household economics, formal and informal risk-coping mechanisms, savings, credit, agriculture, institutions, and service delivery and corruption. Focuses on empirical methods. Problem sets require statistical software such as Stata. (Formerly Economic Development.)

Prerequisite: Prerequisite(s): ECON 1, ECON 2, and ECON 113.

ECON 121 - Economic Growth (5)

Studies economic growth from theoretical, empirical, and historical perspectives. Topics include: theories of economic growth and their empirical importance, technology and innovation, social institutions and growth, and competing explanations of the global distribution of wealth.

Prerequisite: Prerequisite(s): ECON 1, ECON 2, ECON 11A, and ECON 11B (or the equivalent); ECON 100B is strongly recommended.

ECON 124 - Machine Learning for Economists (5)

Introduction to machine learning from the perspective of economics. Students introduced to modern estimation methods for high-dimensional data, which is illustrated through applications to causal inference and prediction problems in economics, business, and related fields. Students gain experience working with these methods through programming assignments. Course focuses on methodology and its practical application and culminates in an empirical project in which students apply course concepts to real-world data.

Prerequisite: Prerequisite(s): ECON 113. Enrollment is restricted to economics, business management economics, global economics, and economics combined majors.

ECON 125 - Economic History of the U.S (5)

The development of the American economy from colonial times to the present, with emphasis on the interaction between

institutional structure and economic development. Topics include the economics of slavery, the rise of big business, and the causes of the Great Depression.

Prerequisite: Prerequisite(s): ECON 1 and ECON 2. Related coursework in history also helpful. Enrollment is restricted to juniors and seniors.

ECON 126 - Why Economies Succeed or Fail: Lessons from Western and Japanese History (5)

Examines the emergence of capitalism and the world's first industrial revolution in Britain, continental Europe industrialization, Soviet economic growth and collapse, and the Japanese economic miracle. Asks about the historical sources of long-run economic development, stagnation, and decline. Draws lessons for current debates over free market versus more interventionist policies, economic reform in the former Communist nations, and economic rivalry between the U.S. and Japan.

Prerequisite: Prerequisite(s): ECON 1 and ECON 2. Related coursework in history also helpful. Enrollment is restricted to juniors and seniors.

ECON 128 - Poverty and Public Policy (5)

Studies the causes, consequences, and governmental response to urban poverty in the U.S. Topics include how public policy, the macroeconomy, race, gender, discrimination, marriage, fertility, child support, and crime affect and are affected by urban poverty. Emphasizes class discussion and research.

Prerequisite: Prerequisite(s): ECON 100A or ECON 100M; and ECON 113. Enrollment is restricted to economics, business management economics, global economics, legal studies, or economics combined majors.

ECON 130 - Money and Banking (5)

Examines the nature of money, financial intermediation, financial asset pricing, and markets; banking business and the banking industry; financial and banking crises, especially the 2007-09 crisis in the U.S. and abroad; the evolving nature of financial regulation and supervision of banking and financial institutions and markets; history and functions of the U.S. central bank (Federal Reserve); the role of the central bank in providing liquidity, credit, and creating money; central bank emergency lending in crises; institutional design of central banks and macroeconomic policy.

Prerequisite: Prerequisite(s): ECON 100B or ECON 100N; and ECON 113.

ECON 131 - International Financial Markets (5)

International financial management analyzes the key financial markets and instruments that facilitate trade and investment activity on a global scale. Inquiry spans two areas: (1) economic determinants of prices in international financial markets; and (2) decisions facing private individuals and enterprises, with topics including capital financing, investment, and risk management.

Prerequisite: Prerequisite(s): ECON 100A or ECON 100M; and ECON 100B or ECON 100N.

ECON 133 - Security Markets and Financial Institutions (5)

An examination of all major financial markets: equities, bonds, options, forwards, and futures. Uses modern financial theory, including asset pricing models such as CAPM and APT.

Prerequisite: Prerequisite(s): ECON 100A or ECON 100M, and ECON 113.

ECON 135 - Corporate Finance (5)

An analysis of financial policies of business enterprises. Topics include cash flow analysis, stock and bond valuation, asset pricing models, capital budgeting, financial market institutions, and financial planning.

Prerequisite: Prerequisite(s): ECON 10A; and ECON 100A or ECON 100M; and ECON 113.

ECON 136 - Business Strategy (5)

The strategic management process, techniques for analyzing single-business and diversified companies, implementing strategy, organization, business planning, financial strategy, competitive analysis, entrepreneurial skills.

Prerequisite: Prerequisite(s): ECON 10A; and ECON 100A or ECON 100M.

ECON 138 - The Economics and Management of Technology and Innovation (5)

Examines the analytics of issues in technology and innovation, including cooperation in research and development (RD), standardization and compatibility, patents and intellectual property rights, and strategic management, using economic models and firm case studies.

Prerequisite: Prerequisite(s): ECON 100A or ECON 100M, or permission of instructor.

ECON 139A - The Economics of Electronic Commerce (5)

An analysis of the broad spectrum of issues affecting commercial uses of the Internet and the next-generation information infrastructure. Uses economics to examine market structure, pricing quality, intellectual property rights, security, electronic payments and currencies, and public policy implications.

Prerequisite: Prerequisite(s): ECON 100A or ECON 100M, or permission of instructor.

ECON 139B - E-Commerce Strategy (5)

Review of economic principles and trends in e-commerce, including online retailing of physical products, digital products and services, financial services, business-to-business transactions, e-business, and e-marketing. Business-to-business and business-to-consumer business models are explored both in terms of strategy and implementation. Topics include how and why successful companies deploy e-business strategies and how

these evolve in fast-changing technological and business environments..

Prerequisite: Prerequisite(s): ECON 139A or ECON 161A.

ECON 140 - International Trade (5)

The theory of international production and trade. The effects of tariffs and quantitative trade restrictions; the nature of economic integration; multinational firms; effects of trade and protection on economic stability and welfare.

Prerequisite: Prerequisite(s): ECON 100A or ECON 100M.

ECON 141 - International Finance (5)

Topics include national accounting, balance of payments theories, parity conditions in international finance, exchange rate determination models, forward-looking financial instruments, international monetary systems, country interdependence and exchange rate regimes, international monetary integration, and Eurocurrency market.

Prerequisite: Prerequisite(s): ECON 100B or ECON 100N.

ECON 142 - Advanced Topics in International Economics (5)

Selected issues in contemporary international economics: theory, empirical evidence, and public policy. Seminar emphasizing discussion and individual research.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; and ECON 100A or ECON 100M; and ECON 100B or ECON 100N; and ECON 140 or ECON 141.

ECON 143 - Policy Issues in the International Economy (5)

Covers selected issues concerning the international economy. Topics include: U.S. competitiveness; U.S. trade policy; immigration; trade and the environment; developing countries; foreign investment; foreign exchange markets; and international economic institutions.

Prerequisite: Prerequisite(s): ECON 1 and ECON 2; and ECON 100A or ECON 100M.

ECON 148 - Latin American Economies (5)

This course is designed to familiarize students with the economic and business environment in Latin America.

Prerequisite: Prerequisite(s): ECON 1 and ECON 2.

ECON 149 - The Economies of East and Southeast Asia (5)

Examines the pattern of international trade, investment, and industrial structure in Asia. Examines competing explanations of rapid growth of Japan, Korea, and Taiwan; presents an overview of economic developments in China, Hong Kong, and Taiwan. Concludes with an analysis of high technology trade and multinationals in Asia in 2000 and beyond.

Prerequisite: Prerequisite(s): ECON 1 and ECON 2.

ECON 150 - Public Finance (5)

Economics of taxation, including incidence, equity issues, efficiency, and supply side effects. Close attention to taxes in the U.S. system and tax-reform issues. Students cannot receive credit for this course and course 250.

Prerequisite: Prerequisite(s): ECON 100A or ECON 100M; and ECON 100B or ECON 100N.

ECON 156 - Health Care and Medical Economics (5)

Health economics theory and review of studies of the health industry, including current topics. Focuses on the structure of the U.S. health care system, including analysis of health policy issues. Relationship to models of perfect competition and efforts at reform.

Prerequisite: Prerequisite(s): ECON 100A or ECON 100M; and ECON 113.

ECON 159 - The Economics of Organizations (5)

Uses an economic approach to shed light on questions such as why and how organizations are formed, and what consequences they may have on the adoption of different types of organizations for economic performance. Also emphasizes differences between the internal markets within organizations and market transactions.

Prerequisite: Prerequisite(s): ECON 100A or ECON 100M.

ECON 160A - Industrial Organization (5)

The structure and conduct of American industry with strong emphasis on the role of government, regulation, anti-trust, etc. The evolution of present-day industrial structure. The problems of overall concentration of industry and of monopoly power of firms. Pricing, output decisions, profits, and waste. Approaches include case study, theory, and statistics.

Prerequisite: Prerequisite(s): ECON 100A or ECON 100M.

ECON 160B - Government and Industry (5)

The influence of government regulation on industry and the allocation of resources is rigorously examined using theory and statistics. Areas of regulation include transportation and power, pollution and congestion, rent control, and liability insurance regulation. Both optimal and actual regulation are examined from the point of view of effectiveness, efficiency, social welfare, and re-distribution.

Prerequisite: Prerequisite(s): ECON 100A or ECON 100M.

ECON 161A - Marketing (5)

The evolution of markets and marketing; market structure; marketing cost and efficiency; public and private regulation; the development of marketing programs including decisions involving products, price, promotional distribution.

Prerequisite: Prerequisite(s): ECON 100A or ECON 100M.

ECON 161B - Marketing Research (5)

Prepares students to conduct market research and use it in solving real management problems. Students work with a company to solve marketing-based problems. Students conduct research, process data, and make a presentation to the company's management. Course work involves marketing, statistics, and communications; material is both qualitative and quantitative.

Prerequisite: Prerequisite(s): ECON 113 and ECON 161A.

ECON 162 - Legal Environment of Business (5)

A study of law and the legal process, emphasizing the nature and function of law within the U.S. federal system. Attention is given to the legal problems pertaining to contracts and related topics, business association, and the impact of law on business enterprise.

Prerequisite: Prerequisite(s): ECON 100A or ECON 100M.

ECON 164 - Economics and the Telecommunications Industry (5)

Covers the economics of the telecommunications industry including telephone, cellular telephone, and data communications. Particular emphasis on the Internet, satellite, paging, cable television, radio and television broadcasting. Examines the industry structure and implications of moving from a regulated environment to competition. Topics examined from a competitive strategic standpoint as well as public policy perspective.

Prerequisite: Prerequisite(s): ECON 100A or ECON 100M; and ECON 113.

ECON 165 - Economics as an Experimental Science (5)

The design, execution, and analysis of laboratory experiments in economics. Students study experimental methodology, critically survey the published literature, and design an experiment. Literature includes lab studies of investigations in auctions, markets, social choice theory, and game theory.

Prerequisite: Prerequisite(s): ECON 100A or ECON 100M.; and ECON 113.

ECON 166A - Game Theory and Applications I (5)

Introduces modern game theory, including applications in social science, biology, and engineering. Topics include extensive form, strategic form, mixed strategies, incomplete information, repeated games, evolutionary games, and simulation techniques.

Prerequisite: Prerequisite(s): STAT 5 or STAT 7 or ECON 113; and ECON 11B or AM 11B, or MATH 11B or MATH 19B. Enrollment is restricted to juniors and seniors.

ECON 166B - Game Theory and Applications II (5)

Explores research frontiers in game theory, emphasizing applications in social science, biology, and engineering. Each interdisciplinary team develops a topic, and presents it to the class in oral and written reports and demonstrations. Students must have shown a strong performance in course 166A or

equivalent. Students cannot receive credit for this course and ECON 272, CSE 209, or BIOE 274.

Prerequisite: Prerequisite(s): ECON 166A or CSE 166A; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to juniors and seniors.

ECON 169 - Economic Analysis of the Law (5)

The application of the theories and methods of neoclassical economics to the central institutions of the legal system, including the common law doctrines of negligence, contract, and property; bankruptcy and corporate law; and civil, criminal, and administrative procedure.

Prerequisite: Prerequisite(s): ECON 100A or ECON 100M or permission of instructor.

ECON 170 - Environmental Economics (5)

Economic analysis of environmental issues. Environmental pollution and deterioration as social costs. Economic policy and institutions for environmental control. Influences of technology, economic growth, and population growth on environmental quality.

Prerequisite: Prerequisite(s): ECON 100A or ECON 100M; and ECON 113.

ECON 171 - Natural Resource Economics (5)

The application of economic analysis to the use of renewable and nonrenewable natural resources. Efficiency and distributional aspects of natural resource scarcity. Measurement of the benefits and costs. Optimal extraction or use policies. Common property and externalities. Government policies.

Prerequisite: Prerequisite(s): ECON 100A or ECON 100M.

ECON 175 - Energy Economics (5)

Applications of micro, welfare, and international economic theory and methodology to the energy field. Questions considered include optimal allocation of natural resources; pricing and investment; regulations and taxes; import and export control; redistributive policies.

Prerequisite: Prerequisite(s): ECON 100A or ECON 100M.

ECON 180 - Labor Economics (5)

A study of topics in modern labor economics with an emphasis on data analysis and econometrics. Topics include labor supply, labor demand, human capital, minimum wage, employment and wage discrimination, immigration, self-employment, earned income tax credit, and unemployment insurance.

Prerequisite: Prerequisite(s): ECON 100A or ECON 100M; and ECON 113.

ECON 183 - Women in the Economy (5)

Study of gender roles in economic life, past and present. Topics include occupational structure, human capital acquisition, income distribution, poverty, and wage differentials. The role of government in addressing economic gender differentials is examined.

Prerequisite: Prerequisite(s): ECON 100A or ECON 100M; and ECON 113 is strongly recommended.

ECON 186 - Mathematical Methods for Economic Analysis (5)

Presents mathematical methods commonly used in graduate-level economic analysis: basic matrix algebra, real analysis, functions, continuity concepts, differentiation, Taylor expansions, and implicit function theorem and optimization.

Prerequisite: Enrollment is restricted to applied economics and finance graduate students.

ECON 188 - Management in the Global Economy (5)

An overview of how firms do business in the global economy. The focus is on the motivations of firm behavior, but also explores the impact of corporate decision-making on national welfare. Includes a mix of business case studies, applied economic theory, and empirical applications.

Prerequisite: Prerequisite(s): ECON 113 and either ECON 100A or ECON 100M.

ECON 190 - Senior Proseminar (5)

Courses focus on problems of interest to advanced students of economics. They offer a flexible framework, so those interested in specific issues can read, present papers, and develop their ideas.

ECON 191 - Economics Teaching Practicum (5)

Each student serves as facilitator for small discussion group in connection with core economics courses. Facilitators complete course readings and meet with instructor as a group to discuss the teaching process. May not be counted toward upper-division major requirements.

ECON 192 - Directed Student Teaching (5)

Teaching of a lower-division seminar, course 42, under faculty supervision. May *not* be counted toward the upper-division major requirements. Students submit petition to sponsoring agency.

ECON 193 - Field Study (5)

Provides for department-sponsored individual field study experience in an area connected with economics or business. Students work 12-14 internship hours per week. May not be counted toward the upper-division major requirements.

Prerequisite(s): ECON 100A, ECON 100B, and ECON 113. Students submit petition to sponsoring agency.

ECON 193F - Field Study (2)

Provides for department-sponsored individual field study experience in an area connected with economics or business under the direct supervision of a faculty sponsor. Students work five-six hours internship hours per week. May not be counted toward the upper-division major requirements. Prerequisite(s): ECON 100A, ECON 100B and ECON 113. Students submit petition to sponsoring agency.

ECON 194 - Advanced Topics in Management (5)

Honors course providing detailed analysis of specialized topics in management. Possible topics include: venture capital, the financial services industry, e-business, behavioral finance, advanced consumer behavior, entrepreneurship, high-tech marketing, risk management, and option value approaches to business strategy. Students cannot receive credit for this course and ECON 194F. Prerequisite(s): ECON 100A or ECON 100M, ECON 100B or ECON 100N, and ECON 113. Enrollment is by permission of instructor, and review of performance in economics courses. Enrollment is restricted to senior and junior business management economics majors.

ECON 194B - Advanced Topics in Business and Professional Development (2)

Enhances students' marketability, strengthens verbal and written communication skills, teaches appropriate business etiquette, improves networking skills, and helps students determine how to become an integral part of an organization's intellectual capacity. Business professionals provide guest presentations.

Prerequisite: Enrollment is restricted to sophomores, juniors, and seniors economics, business management economics, global economics majors and combined majors with mathematics and environmental studies.

ECON 194F - Advanced Topics in Management and Finance (2)

Detailed analysis of specialized topics in management. Possible topics include: venture capital, the financial services industry, e-business, behavioral finance, advanced consumer behavior, entrepreneurship, high-tech marketing, risk management, and option value approaches to business strategy. Formerly, Advanced Topics in Management and Finance.

Prerequisite: Prerequisite(s): ECON 100A or ECON 100M; and ECON 113; ECON 133 or ECON 135 strongly recommended. Enrollment is restricted to senior and junior business management economics majors.

ECON 195 - Senior Thesis (5)

A supervised research project. If the project is of unusual scope, the course may be repeated for credit. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, students submit petition to sponsoring agency.

ECON 197 - Economic Rhetoric: Using Economic Theory and Empirical Evidence in Arguing Policy (5)

Economics students are expected to learn to effectively communicate economic theory and evidence relating to economic policy to audiences that do not have economics degrees. The skills to be learned are both written and oral communication. Students learn to present convincing policy arguments in position papers, executive summaries, and in oral presentation that may include charts and other means of communication.

Prerequisite: Prerequisite(s): Entry Level Writing & Composition requirement; one of the following: ECON 100A, ECON 100M, ECON 100B, ECON 100N, or ECON 113. Restricted to sophomore, junior, and senior economics,

business-management economics, global economics and combined economics/math majors.

ECON 199 - Tutorial (5)

May be repeated for credit, but may be counted only once toward the upper-division major requirements. Undergraduates may not take graduate courses for credit as ECON 199. Students submit petition to sponsoring agency.

ECON 199F - Tutorial (2)

Specialized study with individual faculty. May not be applied toward the major requirements. Students submit petition to sponsoring agency.

Graduate**ECON 200 - Microeconomic Analysis (5)**

Survey of partial equilibrium analysis, market distortions, consumer choice and production and trade theory, perfect and imperfect competition, price discrimination, and intertemporal choice theory.

Prerequisite: Enrollment is restricted to applied economics and finance graduate students.

ECON 201 - Applications in Microeconomics (5)

Applies concepts and tools developed in ECON 200 to problems encountered in private- and public-sector output and labor markets. The focus is empirical; topics include analysis of labor supply and labor demand and the role of government labor market policies, analysis of pricing policies and regulation, estimation of the returns to schooling, estimation of demand and cost functions, and the role of unions in the economy. ECON 200 is strongly recommended as preparation.

Prerequisite: Enrollment is restricted to applied economics and finance graduate students.

ECON 202 - Macroeconomic Analysis (5)

Aggregate economic analysis: determinants of aggregate expenditures and output, the roles of monetary and fiscal policy, recent developments in macro theory; macro policy issues.

Prerequisite: Enrollment is restricted to applied economics and finance graduate students.

ECON 204A - Advanced Microeconomic Theory I (5)

Economic theory of individual and market behavior, including constrained optimization, duality, theory of the consumer, theory of the producer, dynamic optimization, behavior under uncertainty, intertemporal choice, asymmetric information, game theory, partial and general equilibrium, pure and applied welfare economics, public goods and externalities. ECON 204A, ECON 204B, and ECON 204C must be taken in sequence.

Prerequisite: Enrollment is restricted to Ph.D. students in economics or by permission of the instructor.

ECON 204B - Advanced Microeconomic Theory II (5)

Economic theory of individual and market behavior, including constrained optimization, duality, theory of the consumer, theory of the producer, dynamic optimization, behavior under uncertainty, intertemporal choice, asymmetric information, game theory, partial and general equilibrium, pure and applied welfare economics, public goods and externalities. Courses must be taken in sequence.

Prerequisite: Prerequisite(s): ECON 204A.

ECON 204C - Advanced Microeconomic Theory III (5)

Economic theory of individual and market behavior, including constrained optimization, duality, theory of the consumer, theory of the producer, dynamic optimization, behavior under uncertainty, intertemporal choice, asymmetric information, game theory, partial and general equilibrium, pure and applied welfare economics, public goods and externalities. Courses must be taken in sequence.

Prerequisite: Prerequisite(s): ECON 204B.

ECON 205A - Advanced Macroeconomic Theory I (5)

Modern macroeconomic theory: theories of growth and business cycle fluctuations; theories of household and firm behavior; models of financial markets and labor markets; recent developments in the analysis of macroeconomic policy. ECON 205A, ECON 205B, and ECON 205C must be taken in sequence.

Prerequisite: Enrollment is restricted to Ph.D. students in economics or by permission of instructor.

ECON 205B - Advanced Macroeconomic Theory II (5)

Modern macroeconomic theory: theories of growth and business cycle fluctuations; theories of household and firm behavior; models of financial markets and labor markets; recent developments in the analysis of macroeconomic policy. Courses must be taken in sequence.

Prerequisite: Prerequisite(s): ECON 205A.

ECON 205C - Advanced Macroeconomic Theory III (5)

Modern macroeconomic theory: theories of growth and business cycle fluctuations; theories of household and firm behavior; models of financial markets and labor markets; recent developments in the analysis of macroeconomic policy. Courses must be taken in sequence.

Prerequisite: Prerequisite(s): ECON 205B.

ECON 210A - Mathematical Methods for Economic Analysis (5)

Mathematical methods commonly used in economic analysis are discussed. Covers basic matrix algebra, real analysis, functions, continuity concepts, differentiation, Taylor expansion, implicit function theorem, and optimization. Prerequisite(s): qualifications as determined by instructor; inquire at department office.

ECON 210B - Mathematical Methods for Economic Analysis (5)

A course in introductory mathematical economics which covers standard optimization problems, difference and differential equations, optimal control theory, decisions under uncertainty, game theory, and stochastic calculus. ECON 210A or equivalent is strongly recommended as preparation.

ECON 211A - Advanced Econometrics I (5)

Introduces advanced econometric methods. Topics include probability theory, hypothesis testing, linear regression analysis, heteroscedasticity, serial correlation, instrumental variables, and panel data models.

Prerequisite: Enrollment is restricted to economics Ph.D. students or by permission of the instructor.

ECON 211B - Advanced Econometrics II (5)

Focuses on the use of econometric methods for causal inference. Research designs covered include: OLS regression, non-parametric regression, propensity score, panel models, synthetic control, instrumental variables, and regression discontinuity.

Prerequisite: Prerequisite(s): ECON 211A. Enrollment is restricted to graduate students.

ECON 211C - Advanced Econometrics III (5)

Covers the asymptotic theory of m-estimators, resampling methods, nonparametric estimation, and statistical (machine) learning methods commonly used in industry. Emphasis is on theory but students also have the chance to implement some of the methods on real datasets.

Prerequisite: Prerequisite(s): ECON 211A. Enrollment is restricted to graduate students.

ECON 212 - Empirical Project in Econometrics (2)

Empirical project or paper in econometrics to demonstrate student's ability to conduct applied econometric analysis. Ph.D. requirement to be completed by beginning of student's third year of study. Prerequisite(s): ECON 211A and ECON 211B.

ECON 216 - Applied Econometric Analysis I (5)

The use of statistical techniques for the testing of economic hypotheses and the estimation of parameters, with emphasis on regression analysis. Includes methods of dealing with serial correlation, errors in variables, multicollinearity, and heteroscedasticity. Experience with common statistical packages.

Prerequisite: Enrollment is restricted to applied economics and finance graduate students.

ECON 217 - Applied Econometric Analysis II (5)

Covers discrete and limited dependent variable models, nonparametric estimation methods, resampling methods, as well as statistical (machine) learning methods commonly used in industry. Students learn the theoretical foundations behind the methods and also how to apply them in practice.

Prerequisite: Enrollment is restricted to applied economics and finance graduate students.

ECON 220A - Development Economics I (5)

Studies the microeconomics of development. Topics may include health and nutrition, education, intra-household economics, formal and informal risk-coping mechanisms, savings, credit, agriculture, institutions, and service delivery, and corruption.

ECON 220B - Development Economics II (5)

Methodological class covering how to build a good theoretical model, how to derive a convincing test of a model, and how to structurally estimate a model. Examples drawn largely (though not exclusively) from the study of economic development.

ECON 221A - Advanced Methods in Macroeconomics I (5)

Covers major issues in monetary economics, focusing on the core theoretical models employed in monetary economics. Topics include: money in general equilibrium; money-in-the-utility function approaches; cash-in-advance models; search-based models; welfare costs of inflation; optimal inflation tax; informational frictions in monetary economics; financial and credit frictions; nominal price and wage frictions; time-dependent and state-dependent models of price adjustment; and money in new Keynesian models.

Prerequisite: Prerequisite(s): ECON 205A, ECON 205B, and ECON 205C, or by permission of instructor. Enrollment is restricted to graduate students.

ECON 221B - Advanced Methods in Macroeconomics II (5)

Covers major issues in empirical macroeconomics, focusing on structural vector auto-regressions (VARs) and solution and estimation of dynamic stochastic general equilibrium (DSGE) models. Topics include: recursive identification; long-run restrictions; sign-restrictions; Bayesian estimation of DSGE models; model comparisons; non-linear solution methods for DSGE models; particle filters and other advanced topics related to empirical macroeconomics.

Prerequisite: Prerequisite(s): ECON 205A, ECON 205B, and ECON 205C, or by permission of instructor. Enrollment is restricted to graduate students.

ECON 221C - Advanced Methods in Macroeconomics (5)

Focuses on the use of disaggregated data on firms, establishments, workers, and households in macroeconomic research. Students learn about commonly used administrative records, survey data, quasi-experiments, etc., and their use to answer questions of interest to macroeconomists.

Prerequisite: Prerequisite(s): ECON 204C, ECON 205C, ECON 211C. Enrollment is restricted to economics graduate students.

ECON 231 - International Financial Management (5)

Equips students with the analytical tools they need to make informed financial decisions and manage the risks that businesses face in today's competitive global environment.

Covers the fundamental theories and real-world examples in international financial markets.

Prerequisite: Prerequisite(s): ECON 233. Enrollment is restricted to graduate students in Applied Economics and Finance.

ECON 233 - Finance I (5)

Applications of economic analysis in private finance. Topics include risky choice and intertemporal choice theory, asset pricing models, efficient market hypotheses, market institutions, and derivative securities. ECON 200 is strongly recommended as preparation.

Prerequisite: Enrollment is restricted to applied economics and finance graduate students.

ECON 234 - Financial Institutions and Markets (5)

Examines various aspects of financial institutions and markets, with emphasis on financial stability and sustainability. Topics include the role banks and other financial intermediaries play in achieving ESG sustainability goals and minimizing systemic risks. The course also discusses the structure of financial regulation and its role in achieving stability and sustainability goals.

Prerequisite: Prerequisite(s): ECON 233.

ECON 235 - Corporate Finance (5)

Application of modern financial theory to corporate decision making. Topics covered include capital budgeting and the firm's investment decision, capital structure, dividend policies, and the implications of corporate governance for enterprise financial goals.

Prerequisite: Prerequisite(s): ECON 233.

ECON 236 - Financial Engineering (5)

This course surveys the financial risks faced by corporation, banks, and other financial institutions that arise from changes in interest rates, foreign exchange rates, commodity prices, and stock prices. It examines the characteristics, payoffs, and pricing of financial derivatives and other instruments for managing risk, including options, forwards, futures, swaps, structured notes, and asset-backed securities. Several cases will be used to illustrate how actual firms solve financial risk management problems.

Prerequisite: Prerequisite(s): ECON 233. Enrollment is restricted to applied economics and finance graduate students.

ECON 238 - Market Design: Theory and Pragmatics (5)

Surveys the principles of mechanism design and applies them to a variety of 21st Century markets, e.g., for energy, spectrum, finance, online ads, and predictions. Student teams develop new applications.

Prerequisite: Enrollment is restricted to graduate students.

ECON 239 - Current Topics in Finance (5)

Topics in finance selected by the instructor.

Prerequisite: Prerequisite(s): ECON 233.

ECON 240A - International Trade I (5)

The theory of international trade and commercial policy. Both traditional analyses and recent developments are covered. Topics include both normative and positive theoretical analyses, as well as empirical testing of theory.

Prerequisite: Enrollment is restricted to graduate students. ECON 204A, ECON 204B, and ECON 204C are strongly recommended as preparation.

ECON 240B - International Trade II (5)

The second quarter of a two-quarter sequence which focuses on advanced research topics in trade and its intersection with applied microeconomics. The course is theoretical and empirical, and designed to acquaint students with recent developments in the field. Research topics include: trade and development; political economy of trade policies; trade and labor markets; trade and environment; theories, determinants, and implications of foreign direct investments; economic geography; and spatial/urban economics.

Prerequisite: Prerequisite(s): ECON 240A.

ECON 241A - Advanced International Finance I (5)

Covers the foundations of international macroeconomics. Topics include international borrowing and lending, the role of international financial markets, exchange rate economics, wealth and income in open economies, and macroeconomic policy interdependence.

ECON 241B - Advanced International Finance II (5)

Covers major topics in international finance and open economy macroeconomics, focusing on contemporary theoretical and empirical analysis. Topics include: international capital flows, financial crises, exchange rate economics, financial policy intervention, and fiscal and monetary policies in open economies.

ECON 241C - Advanced International Finance III (5)

Covers contemporary research topics in international macroeconomics and finance, including advances in both theoretical analysis and empirical methods. Specific topics on international macroeconomics, finance, and policy vary. Courses ECON 202 and ECON 203 or ECON 205A-ECON 205B-ECON 205C strongly recommended as preparation.

ECON 249A - International Trade and Development Policy I (5)

Focuses on a range of real-life issues in international trade and development. Topics include North American Free Trade Agreement (NAFTA), the semiconductor industry, the Boeing-Airbus aircraft trade problems, the World Trade Organization (WTO) and developing countries, U.S./Japan trade, trade and the environment, and U.S./China trade.

Prerequisite: Enrollment is restricted to graduate students.

ECON 249B - International Trade and Development Policy II (5)

Emphasizes government policies to promote growth. Topics include the Washington Consensus, the East Asian model, and recent policy changes in East Asia, Latin America, Eastern Europe, and the former Soviet Union.

Prerequisite: Prerequisite(s): ECON 249A. Enrollment is restricted to graduate students.

ECON 250A - Applied Microeconomics I (5)

Theory of the role of public sector expenditures and taxes in market economies. Analyzes efficiency and equity arguments for government intervention. Topics include the role of public debt and deficits in economies, international effects of tax and spending policies, and economic theories of public sector decision making. ECON 204A and ECON 205A are strongly recommended as preparation. Students cannot receive credit for this course and ECON 150.

ECON 250B - Applied Microeconomics II (5)

Covers topics in applied microeconomics, including public, labor, education, environmental, and health. Discusses advanced econometric techniques used to establish causal identification. Students read and evaluate current research and develop an independent research agenda.

ECON 250C - Applied Microeconomics III (5)

Covers topics in applied microeconomics, with an emphasis on labor topics not covered in 250A and 250B. Students read and evaluate current research, discuss applications of advanced econometric techniques for causal identification, and develop an independent research agenda.

Prerequisite: Prerequisite(s): ECON 204C and ECON 211C. ECON 250A and ECON 250B are strongly recommended as preparation. Enrollment is restricted to economics Ph.D. students.

ECON 259A - Cost-Benefit Analysis (5)

Applications of economic analysis in public finance, largely from the revenue side: taxation. The issues considered include the effects of taxation on consumer welfare, consumption, labor, capital, production, growth. Course 200 is strongly recommended as preparation. Students cannot receive credit for this course and course 153.

ECON 259B - Public Policy Analysis (5)

Applications of welfare and microeconomic theory and methodology to the public expenditure question: cost-benefit. Effects of the taxes discussed in course 259A and sophisticated tools used in the face of these and other distortions with regard to measurement of benefits, costs, and the discount rate. Course 200 strongly recommended as preparation.

ECON 270 - Advanced Topics in Applied Microeconomics (5)

Advanced topics and current research in microeconomic theory and applications, including topics on decision theory, game theory, behavioral economics, and general equilibrium analysis.

ECON 272 - Evolutionary Game Theory (5)

Reviews static equilibrium concepts, games of incomplete information, and the traditional theory of dynamic games in discrete time. Develops recent evolutionary game models, including replicator and best reply dynamics, and applications to economics, computer science, and biology. Prerequisite(s): upper-division math courses in probability theory are strongly recommended. Cannot receive credit for this course and ECON 166B or CSE 166B.

ECON 274 - Workshop in Macroeconomics and Monetary Economics (3)

For Ph.D. students in economics who are at the early stages of their research careers as well as for those who are engaged in dissertation work in macroeconomics and monetary economics. Topics vary from quarter to quarter depending on the interests of participants.

Prerequisite: Prerequisite(s): ECON 205A, ECON 205B, and ECON 205C, or by consent of instructor. Enrollment is restricted to graduate students.

ECON 275 - Workshop in Applied Microeconomics (3)

For Ph.D. students in economics who are at the early stages of their research careers as well as for those who are engaged in dissertation work in applied microeconomics or other empirical work. Topics vary from quarter to quarter depending on the interests of participants.

Prerequisite: Enrollment is restricted to graduate students.

ECON 276 - Workshop in Experimental Economics (3)

For economics doctoral students who are at early stages of their research careers as well as those engaged in dissertation research using laboratory experiments and related techniques. Topics vary from quarter to quarter depending on the interest of participants. Enrollment is by permission of instructor.

ECON 290 - Topics in International Economics (5)

Covers several advanced topics in the history of international economics, international trade, and international finance. Topics include imperfect competition and trade, strategic trade policies, increasing returns, and the pattern of trade, economic geography, exchange rate target zones, and balance of payment crises. Topics vary from year to year. Courses 204A-ECON 204B-ECON 204C and ECON 205A-ECON 205B-ECON 205C are strongly recommended as preparation.

ECON 291 - Workshop in Applied Economics (5)

Experience in applied projects, report writing and presentation, drawing on previous coursework.

ECON 293 - Field Study (5)

Students will undertake analytical projects in public or private institutions. The material covered must be different from that of the thesis topic.

ECON 294A - Applied Economics and Finance Laboratory (2)

Practical experience in managing computerized data sets and running statistical packages. Covers STATA and R.

Prerequisite: Enrollment is restricted to applied economics and finance graduate students.

ECON 294B - Applied Economics and Finance Seminar (2)

Bi-weekly seminars designed to present students with current working applications in various fields of applied economics and finance.

Prerequisite: Enrollment is restricted to applied economics and finance graduate students.

ECON 294C - Economics Guest Seminar Series (1)

Bi-weekly seminars by visiting faculty and industry leaders who are experts in their fields provide in-depth insight on topics relevant to graduate students in economics.

Prerequisite: Enrollment is restricted to graduate students.

ECON 294D - Applied Economics Seminar (2)

Weekly seminar designed to present students with current working applications in various fields of applied economics.

Prerequisite: Enrollment is restricted to economics Ph.D. students.

ECON 295 - Directed Reading (5)

Reading in research area of student interest, with faculty supervision through weekly discussion. Students submit petition to sponsoring agency.

ECON 296A - Third Year Ph.D. Seminar (5)

Student presentations of literature and/or original research in areas of student research interest. Student discussion of presentations under faculty supervision.

Prerequisite: Prerequisite(s): ECON 204C, ECON 205C, ECON 211B, ECON 240A, ECON 240B, ECON 241A, and ECON 241B.

ECON 297A - Independent Study (5)

Independent study and research under faculty supervision. Students submit petition to sponsoring agency.

ECON 297B - Independent Study (10)

Independent study and research under faculty supervision. Students submit petition to sponsoring agency.

ECON 297C - Independent Study (15)

Independent study and research under faculty supervision. Students submit petition to sponsoring agency.

ECON 298A - Master's Thesis Research (5)

May be taken once to meet course requirements for the master's degree. Students submit petition to sponsoring agency.

ECON 298B - Master's Thesis Research (10)

May be taken once to meet course requirements for the master's degree. Students submit petition to sponsoring agency.

ECON 298C - Master's Thesis Research (15)

May be taken once to meet course requirements for the master's degree. Students submit petition to sponsoring agency.

ECON 299A - Doctoral Thesis Research (5)

Research toward Ph.D. dissertation under faculty supervision. Prerequisite(s): advancement to candidacy and students submit petition to sponsoring agency. (Formerly, course 298 Dissertation Research)

ECON 299B - Doctoral Thesis Research (10)

Research toward Ph.D. dissertation under faculty supervision. Prerequisite(s): advancement to candidacy and students submit petition to sponsoring agency. (Formerly, course 298 Dissertation Research)

ECON 299C - Doctoral Thesis Research (15)

Research toward Ph.D. dissertation under faculty supervision. Prerequisite(s): advancement to candidacy and students submit petition to sponsoring agency. (Formerly, course 298 Dissertation Research)

EDUC - EDUCATION**Lower-Division****EDUC 10 - Introduction to Learning (5)**

Survey course exploring the foundational perspectives on learning, especially when considering learners from non-dominant communities, how those views of learning are reflected in what and how students learn in school and out of school, and how those views of learning can impact teaching practices.

EDUC 50A - CAL Teach 1: Science and Mathematics (2)

Introductory seminar exploring secondary students, teaching, and schools in the context of science and/or mathematics instruction. Concurrent participation in a secondary school internship required. Course material supports and enhances students' placement experiences. Prerequisite(s): Acceptance into CAL Teach and concurrent participation in a secondary school internship in a science or math classroom.

EDUC 50B - CAL Teach 1: Mathematics (2)

Introductory seminar exploring secondary students, teaching, and schools in the context of mathematics instruction. Concurrent participation in a secondary school internship required. Course material supports and enhances students' placement experiences. Prerequisite(s): Acceptance into CAL Teach and concurrent participation in a secondary school internship in a math classroom.

EDUC 50C - CAL Teach 1: Science (2)

Introductory seminar exploring secondary students, teaching, and schools in the context of science instruction. Concurrent participation in a secondary school internship required. Course material supports and enhances students' placement experiences. Prerequisite(s): Acceptance into CAL Teach and concurrent participation in a secondary school internship in a science classroom.

EDUC 60 - Schooling, Democracy, and Justice (5)

Survey course exploring the foundations of public education in the United States, including: the social and political forces within schools and school systems in the U.S. the history and formation of the system and the educational policies and practices in our culturally and linguistically diverse nation. (Formerly Introduction to Education: Learning, Schooling, and Society.)

EDUC 99 - Tutorial (5)

Students submit petition to sponsoring agency.

Upper-Division**EDUC 100A - Cal Teach 2: Science and Mathematics (2)**

Examines students, schools, and science and/or mathematics instruction with emphasis on developing an instructional project aligned with state-mandated content standards. Concurrent participation in a secondary school internship required. Course content supports and enhances students' internship experience.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; EDUC 50A, EDUC 50B, or EDUC 50C; and acceptance into the Cal Teach program. Enrollment is restricted to sophomores, juniors, and seniors.

EDUC 100B - Cal Teach 2: Mathematics (2)

Examines students, schools, and mathematics instruction with emphasis on developing an instructional project aligned with state-mandated content standards. Concurrent participation in a secondary school internship required. Course content supports and enhances students' internship experience.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; EDUC 50A, EDUC 50B, or EDUC 50C; and acceptance into the Cal Teach program. Enrollment is restricted to sophomores, juniors, and seniors.

EDUC 100C - Cal Teach 2: Science (2)

Examines students, schools, and science instruction with emphasis on developing an instructional project aligned with state-mandated content standards. Student must concurrently participate in a K-12 school internship. Concurrent participation in a secondary school internship required. Course content supports and enhances students' internship experience.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; EDUC 50A, EDUC

50B, or EDUC 50C; and acceptance into the Cal Teach program. Enrollment is restricted to sophomores, juniors, and seniors.

EDUC 102 - Education, Media, and Society (5)

Focusing on ways the media (both news and the entertainment industry) portrays schools, teachers, and students to the public, investigates the way society views education, the way education is presented in the media, and the way education is influenced by society.

Prerequisite: Enrollment is restricted to education or STEM minors, physics education majors, or students with math education concentration or Earth sciences science education concentration, or biology B.A. bioeducation, or by permission of instructor.

EDUC 104 - Ethical Issues and Teaching (5)

Emphasizes a philosophical exploration of the moral complexities of teaching. Students read theoretical investigations of these complexities, and examine case studies that pose difficult moral questions and illuminate the dilemmas of everyday life in classrooms. Course is grounded in a dialogical approach to learning.

Prerequisite: Enrollment restricted to education or STEM minors, physics education majors, or students with math education concentration or Earth sciences science education concentration, or biology B.A. bioeducation, or by permission of instructor.

EDUC 110 - Popular Education, Democracy, and Social Movements (5)

Explores the connections among conceptions of communicative action, education, social movements for justice, and the formation of democratic communities in the U.S. It situates 20th and 21st century popular education practices against the unrealized promise of U.S. public schooling and the struggles of disenfranchised and marginalized communities to make schools and learning serve their needs. Finally, the course outlines principles of popular education that have emerged from social movements and that can guide future efforts to embody forms of education that are practices of freedom, justice, and democracy

Prerequisite: Prerequisite(s): Entry-Level Writing and Composition requirements. EDUC 10 and EDUC 60. Enrollment is restricted to junior and senior education, democracy and justice majors, science education majors, STEM education minors, and education minors, or by permission of instructor.

EDUC 115 - K-12 Student Assessment (5)

Provides an overview of educational testing. Appropriate use and interpretation of standardized, classroom achievement and special needs assessments are examined. Issues on fair testing of diverse populations of students are discussed within each topic area.

Prerequisite: Enrollment restricted to education or STEM minors, physics education majors, or students with math

education concentration or Earth sciences science education concentration, or biology B.A. bioeducation, or by permission of instructor.

EDUC 120 - The Arts in Schools: Aesthetic Education Theory and Practice (5)

Explores the historical legacy of the arts within education; considers aesthetic education as an inter-arts philosophical and practical endeavor; studies alternatives to the current situation of the arts in education; develops theory, curricula and methods necessary to teach the arts. Addresses both elementary and secondary teaching in the arts. Meets third-course requirements.

Prerequisite: Enrollment is restricted to junior and senior education minors; STEM education minors; education, democracy and justice majors; science education majors; or by permission of instructor.

EDUC 125 - Multicultural Children's Literature for Elementary Classrooms (5)

Offers opportunities for undergraduate and graduate students to learn about fundamental aspects of children's literature, increase their knowledge of range and quality of children's literature, enhance their understanding of multicultural children's literature, and develop ways to integrate children's literature into elementary- and middle-school curriculum areas.

Prerequisite: Enrollment is restricted to junior and senior education or STEM minors, physics education majors, or students with math education concentration or Earth sciences science education concentration, or biology B.A. bioeducation, or by permission.

EDUC 126 - Foundations of Literacy Learning: Contemporary Perspectives (5)

Offers an overview of historical and contemporary perspectives regarding literacy learning in America. Using a socio-cultural lens and research findings to analyze instructional practices, it provides foundational knowledge for potential teachers and policy makers regarding literary education.

Prerequisite: Prerequisite(s): EDUC 60 and EDUC 180.

EDUC 128 - Immigrants and Education (5)

Research and theory on the education of immigrant students. Major topics include the Americanization movement and America's changing demography, identity maintenance and change, home-school relations, and educators' roles in meeting the needs of culturally and linguistically diverse student populations.

Prerequisite: Enrollment is restricted to education or STEM minors, physics education majors, or students with math education concentration or Earth sciences science education concentration, or biology B.A. bioeducation, or by permission of instructor.

EDUC 135 - Gender and Education (5)

Addresses the changing but continuing patterns of unequal expectations, opportunities, and treatment throughout the

educational system for all students, female and male, who do not match a standard model of gender performance.

Prerequisite: Enrollment is restricted to education or STEM minors, physics education majors, or students with math education concentration or Earth sciences science education concentration, or biology B.A. bioeducation, or by permission of instructor.

EDUC 140 - Language, Diversity, and Learning (5)

Explores the intersection between language, diversity, and education to examine the education of youth who have been historically underserved by schools. Topics include dialect and register variation; language policy; and sociocultural perspectives on learning/teaching of language.

Prerequisite: Enrollment is restricted to education or STEM minors, physics education majors, or students with math education concentration or Earth sciences science education concentration, or biology B.A. bioeducation, or by permission of instructor.

EDUC 141 - Bilingualism and Schooling (5)

Introduces participants to issues related to the schooling of students who speak languages other than or in addition to English. Uses a multidisciplinary perspective to understand the circumstances these students face in schools and considers approaches and policies that best meet their needs.

Prerequisite: Enrollment is restricted to education or STEM minors, physics education majors, or students with math education concentration or Earth sciences science education concentration, or biology B.A. bioeducation, or by permission of instructor.

EDUC 160 - Issues in Educational Reform (5)

Explores a variety of perspectives on key educational policy issues including desegregation, bilingual education, affirmative action, charter schools, national and state curriculum standards, student assessment and the assessment and certification of teachers.

Prerequisite: Enrollment is restricted to education or STEM minors, physics education majors, or students with math education concentration or Earth sciences science education concentration, or biology B.A. bioeducation, or by permission of instructor.

EDUC 162 - Critical Youth Studies in Education (5)

Examines youth as a social construction, relation, and achievement to understand the everyday lives, experiences, learning, and education of youth. Explores the development, histories, cultures, politics, and resistance of youth in education, focusing on race, gender/sexuality, class, and their intersections.

Prerequisite: Enrollment restricted to junior and senior education minors.

EDUC 164 - Urban Education (5)

Focuses on urban schooling through critical readings, fieldwork, group projects, and extensive writing. Students

explore how socialization, marginalization, and assimilation impede or support academic success, how class intersects with race, and how culture affects one's orientation to education.

Prerequisite: Enrollment restricted to education or STEM minors, physics education majors, or students with math education concentration or Earth sciences science education concentration, or biology B.A. bioeducation, or by permission of instructor.

EDUC 166 - Technology and Education (5)

Explores the history of technology in education from approximately 1950 to the present, addressing the interpersonal, epistemological, and pedagogical differences between digital and analog learning. Although no programming experience is required, participants will create an instructional application.

Prerequisite: Enrollment is restricted to junior and senior education minors, STEM education minors, education democracy and justice majors, science education majors, or by permission of instructor.

EDUC 170 - East Asian Schooling and Immigration (5)

Focuses on an historical and contemporary study of education in Japan, China, Korea, Hong Kong, and Taiwan, and the adaptation to schooling in the U.S. of immigrant families from those cultures. Topics include the effects on schooling of language acquisition, religion and cultural practices, family patterns, socioeconomic status, career aspirations, and parental expectations.

Prerequisite: Enrollment is restricted to education or STEM minors, physics education majors, or students with math education concentration or Earth sciences science education concentration, or biology B.A. bioeducation, or by permission of instructor.

EDUC 171 - South and Southeast Asian Schooling and Immigration (5)

Historical and contemporary study of education in India, Vietnam, Cambodia, Laos, and the Philippines, and the adaptation to schooling in the U.S. of immigrant families. Topics include: effects of language acquisition; religion and cultural practices; family patterns; socioeconomic status; career aspirations; and parental expectations.

Prerequisite: Enrollment is restricted to education or STEM minors, physics education majors, or students with math education concentration or Earth sciences science education concentration, or biology B.A. bioeducation, or by permission of instructor.

EDUC 173 - Seminar in Critical Pedagogy (5)

Philosophical and pedagogical exploration of relationships among oppression, power, society, education, and change. Examines how history, power, economics, and discrimination shape societal perspectives and schooling practices, and considers ways to transform education.

Prerequisite: Enrollment is restricted to education or STEM minors, physics education majors, or students with math

education concentration or Earth sciences science education concentration, or biology B.A. bioeducation, or by permission of instructor.

EDUC 174 - Ethnographic Research in Schools and Communities (5)

Explores ethnographic research as an important path for future teachers in understanding how diverse communities provide and support schooling at all levels.

Prerequisite: Prerequisite(s): EDUC 60 and EDUC 180. Enrollment is restricted to junior and senior education or STEM minors or by permission of instructor.

EDUC 177 - Teaching Linguistically Diverse Students (5)

Examines equity issues in the learning and teaching of math and science in culturally and linguistically diverse school settings. Draws on multicultural, bilingual, and math/science education perspectives. Intended for undergraduate majors considering a K-12 teaching career. Satisfies an elective requirement for the minor in education program. Prior completion of EDUC 180 is advised. (Formerly Teaching Culturally and Linguistically Diverse Students Math and Science.)

Prerequisite: Enrollment is restricted to education or STEM minors, science education majors, or students with math education concentration, or by permission of instructor.

EDUC 178 - Special Topics in Education (5)

Taught on a rotating basis by various faculty members. The precise focus of each year's course will vary according to the instructor. Please contact the department for information on the current topic. Individual topics may be applied only once to the education minor, STEM minor or education major. (Formerly Advanced Educational Studies.)

Prerequisite: Enrollment is restricted to junior and senior education and STEM minors, education, democracy, and justice, science education, and sociology majors or by permission of instructor.

EDUC 180 - Introduction to Teaching (5)

Designed to encourage students to think about teaching in new ways. Assumptions about teaching and schooling are examined as well as considering what it takes to teach so that children learn and understand. Not a course in how to teach, but an opportunity to reconsider what teaching should try to accomplish and what kinds of learning teachers should foster. Practicum in the schools of 30 hours per quarter required.

Prerequisite: Prerequisite(s): Entry Level Writing and Composition requirements; and EDUC 60. Enrollment is restricted to junior and senior education, democracy and justice majors, science education majors, STEM education minors, and education minors, or by permission of instructor.

EDUC 181 - Race, Class, and Culture in Education (5)

Examines the schooling experience and educational attainment of racial/ethnic minority students in the U.S. Focuses primarily on domestic minorities. Addresses issues of variability between

and within minority groups and the role of cultural, structural, and psychological factors in the educational attainment of these students.

Prerequisite: Enrollment is restricted to education or STEM minors, physics education majors, or students with math education concentration or Earth sciences science education concentration, or biology B.A. bioeducation, or by permission of instructor.

EDUC 182 - Social and Political Contexts of Teachers' Work (5)

Explores the social, cultural, historical, and policy context of teachers' work in the United States. Examines the historical evolution and development of the teaching profession, explores contemporary images of teachers, analyzes demographics of the teaching workforce, and investigates the sources of teacher motivation, satisfaction and frustration. In particular, students examine student, cultural, media, teacher and policy representations of teachers and their work. Whenever possible, students will engage with what teachers' themselves say about their work, rather than relying on second-hand accounts with the aim of building a picture of the complexity of teachers' work. (Formerly American Teacher.)

Prerequisite: Enrollment is restricted to junior and senior education or STEM minors, education, democracy and justice, science education, sociology, and critical race and ethnic studies majors, or by permission of instructor.

EDUC 183 - Children's Mathematical Thinking (5)

Provides an introduction to children's mathematical thinking and an overview of major themes, issues, and questions that researchers in mathematics education have studied in relation to children's mathematical thinking.

Prerequisite: Prerequisite(s): EDUC 60. Enrollment is restricted to education or STEM minors; physics education majors; students with math education concentration; Earth Sciences science education concentration; biology B.A. bioeducation; or by instructor permission.

EDUC 185B - Introduction to Mathematics Education (5)

Provides an introduction to principles and practices for mathematics education; examines how research on learning and teaching mathematics informs approaches to teaching mathematics; provides an introduction to national and state standards, mathematics curricula, and other current issues in mathematics education.

Prerequisite: Prerequisite(s): MATH 11A and MATH 11B, or MATH 19A and MATH 19B; or MATH 20A and MATH 20B; or AM 11A and AM 11B; or equivalent courses (by instructor approval); or by permission of the instructor.

EDUC 185C - Introduction to Teaching Science (5)

An introduction to the principles and practices for teaching science in secondary classrooms. Course examines theoretical and practical approaches to teaching science, provides an introduction to national and state standards and an overview of science curricula and current issues in science teaching.

Prerequisite: Enrollment is restricted to juniors, seniors, or education minors or by permission of instructor.

EDUC 185L - Introduction to Teaching: Cal Teach 3 (3)

Supplements theoretical and practical introduction to the teaching of science or mathematics with subject-pedagogical approaches. Concurrent participation in an advanced Cal Teach internship provides context to apply theory and practical techniques. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; EDUC 50A, EDUC 50B, or EDUC 50C; EDUC 100A, EDUC 100B, or EDUC 100C; EDUC 185B or EDUC 185C. Enrollment restricted to juniors and seniors or education minors, or by permission of instructor.

EDUC 187 - Cognition and Instruction (5)

Addresses the question, How do people learn? by examining theories of learning and research on cognition, learning, and instruction.

Prerequisite: Enrollment is restricted to juniors, seniors, or education minors, or by permission of instructor.

EDUC 190 - Senior Seminar Capstone (5)

Senior seminars focus on advanced topics in education. The pedagogical goals vary by instructor but often emphasize at least one of the following: critical and analytical thinking, field research, advanced research methods (qualitative or quantitative), or advanced theory. Satisfies senior capstone requirement.

Prerequisite: Prerequisite(s): Entry Level Writing and Composition requirements. EDUC 10 and EDUC 60; EDUC 110 or EDUC 180. Enrollment is restricted to education, democracy and justice majors, or by permission of instructor.

EDUC 194 - Group Projects (5)

Students submit petition to sponsoring agency.

EDUC 194F - Group Projects (2)

Students submit petition to sponsoring agency.

EDUC 197A - Cal Teach Special Project (1)

Work with K-12 students on science or math projects, ideally involving inquiry-based learning. Site supervision provided by a credentialed teacher. Project-dependent reading and writing assignments negotiated with instructor. Projects will be offered as available or initiated by student. Enrollment is by interview only. Prerequisite(s): EDUC 50A, EDUC 50B, or EDUC 50C. Enrollment is restricted to majors in the physical and biological sciences and majors in the school of engineering or by permission of instructor.

EDUC 197B - Cal Teach Special Project (2)

Work with K-12 students on science or math projects, ideally involving inquiry-based learning. Site supervision provided by a credentialed teacher. Project-dependent reading and writing assignments negotiated with instructor. Projects will be offered as available or initiated by student. Enrollment is by interview

only. Prerequisite(s): EDUC 50A, EDUC 50B, or EDUC 50C. Enrollment is restricted to majors in the physical and biological sciences and majors in the school of engineering or by permission of instructor.

EDUC 197C - Cal Teach Special Project (3)

Work with K-12 students on science or math projects, ideally involving inquiry-based learning. Site supervision provided by a credentialed teacher. Project-dependent reading and writing assignments negotiated with instructor. Projects will be offered as available or initiated by student. Enrollment is by interview only. Prerequisite(s): course 50A, 50B, or 50C. Enrollment is restricted to majors in the physical and biological sciences and majors in the school of engineering or by permission of instructor.

EDUC 198 - Independent Field Study (5)

Students submit petition to sponsoring agency.

EDUC 198F - Independent Field Study (2)

Students submit petition to sponsoring agency.

EDUC 199 - Tutorial (5)

Students submit petition to sponsoring agency.

EDUC 199F - Tutorial (2)

Students submit petition to sponsoring agency.

Graduate

EDUC 200 - Beginning Student Teaching (5)

A required course that introduces students to the diverse cultural and linguistic settings of today's classrooms. Classroom practices, instructional strategies, and analysis are emphasized. First course in the student teaching placement series. Placements are used to examine and apply teaching methods while developing classroom management skills. Class meetings include discussion and demonstration of teaching methods.

Prerequisite: Enrollment is restricted to MA/credential students.

EDUC 201 - Intermediate Student Teaching (5)

Designed to provide students enrolled in the UCSC teacher education program a coherent, integrated, pre-professional experience in public school classrooms. Students assume part-time student teaching responsibilities totalling 14–16 hours per week under the direct supervision of an exemplary classroom teacher. Weekly seminars and ongoing supervision by department staff are required.

Prerequisite: Prerequisite(s): EDUC 200. Enrollment is restricted to MA/credential students.

EDUC 201A - Intermediate Student Teaching: Single Subject (5)

Provides advanced pre-professional experience for single subject teaching candidates who progressively assume full-time responsibility for public school student teaching beginning in winter quarter. Taken concurrently with EDUC 201. Weekly supervision and seminars with teacher supervisors are required.

Prerequisite: Prerequisite(s): EDUC 200. Enrollment is restricted to MA/credential students.

EDUC 202A - Advanced Student Teaching (5)

Designed for students who have extensive field and course experience in education, and who wish to qualify for the single-subject or multiple-subject teaching credential by undertaking a quarter of full-time, supervised student teaching.

Prerequisite: Prerequisite(s): EDUC 201. Enrollment is restricted to M.A./credential students.

EDUC 202B - Advanced Student Teaching (5)

Designed for students who have extensive field and course experience in education, and who wish to qualify for the single-subject or multiple-subject teaching credential by undertaking a quarter of full-time, supervised student teaching.

Prerequisite: Prerequisite(s): EDUC 201. Enrollment is restricted to M.A./credential students.

EDUC 202C - Advanced Student Teaching (5)

Designed for students who have extensive field and course experience in education, and who wish to qualify for the single-subject or multiple-subject teaching credential by undertaking a quarter of full-time, supervised student teaching.

Prerequisite: Prerequisite(s): EDUC 201. Enrollment is restricted to M.A./credential students.

EDUC 203 - Teaching English Language Development: Foundations, Approaches, and Strategies (5)

This course will help future educators develop a practical theory for teaching English as a second language in K-5 schools. Topics include the theoretical foundation for language acquisition; current trends and research in the field; the role of culture in teaching English learners; language assessment; and the design of instructional units. Also focuses on teaching social studies to English learners. Enrollment restricted to M.A./credential students.

Prerequisite: Enrollment is restricted to MA/credential students.

EDUC 204 - Methods of English Language Development: Single Subject (5)

Course helps future educators develop a practical theory for teaching English in the elementary and secondary schools to students who speak other languages. Topics include current trends in the field, language assessment, and the design of instructional units.

Prerequisite: Enrollment is restricted to MA/credential students.

EDUC 205 - Teaching, Learning, and Schooling in a Diverse Society (5)

Required for master's students in education other than those in an approved 4+1 pathway who have the option to waive the course; offered in summer. Three basic units comprise the subject matter: teaching/learning, with such topics as development, learning, pedagogy, and socialization theories;

schooling, as the context of teaching/learning both in its existent structures and its reform movements; and the sociocultural context in which educational institutions exist, topics such as cultural and historical forces, political and economic condition, family, and community structures.

Prerequisite: Enrollment is restricted to MA/credential students.

EDUC 206 - Teaching, Learning, and Schooling: Single Subject (5)

Required for master's students in education; offered in summer. Three basic units comprise the subject matter: teaching/learning, with such topics as development, learning, pedagogy, and socialization theories; schooling, as the context of teaching/learning both in its existent structures and its reform movements; and the sociocultural context in which educational institutions exist, including topics such as cultural and historical forces, political and economic conditions, family, and community structures.

Prerequisite: Enrollment is restricted to MA/credential students.

EDUC 207 - Social Foundations of Education (5)

Offered in summer. A sustained inquiry into the social, political, economic, and historical foundations of schools with an emphasis on community attitudes toward education. Student narratives of engagement and resistance will provide a basis for insights and interventions useful to educators.

Prerequisite: Enrollment is restricted to MA/credential students.

EDUC 208 - Portfolio Development (2)

Offered in summer. Provides student and faculty adviser with time to confer over the completion of the required portfolio.

Prerequisite: Enrollment is restricted to MA/credential students.

EDUC 210 - Health, Safety, and Community (2)

Offered in summer. Addresses the preparation of teachers for creating a supportive, healthy environment for student learning. Covers topics related to physical, emotional, and social health.

Prerequisite: Enrollment is restricted to MA/credential students.

EDUC 211 - Teaching Special Populations in the General Education Classroom (2)

Addresses the preparation of teachers for meeting needs of special populations within the general education setting. Covers basic knowledge, skills, and strategies. (Formerly Topics in Elementary Education: Teaching Special Populations.)

Prerequisite: Enrollment is restricted to MA/credential students.

EDUC 212A - Bilingualism and Biliteracy: History, Politics, Theory, and Practice (2)

Taught in Spanish. Prepares future bilingual teachers to be knowledgeable about history, politics, theory, and practices related to bilingual instructional programs. Topics: second-language acquisition, bilingual-program models, equity pedagogy.

Prerequisite: Enrollment is restricted to MA/credential students.

EDUC 212B - Bilingualism and Biliteracy: Language, Literacy and Content Instruction (2)

Taught in Spanish. Prepares future bilingual teachers to teach language, literacy, and the content areas in ways that address the needs of culturally and linguistically diverse students.

Topics: literacy in two languages; academic language; assessment.

Prerequisite: Enrollment is restricted to MA/credential students.

EDUC 212C - Bilingualism and Biliteracy: Community and School Partnerships (2)

Taught in Spanish. Provides opportunities for future bilingual teachers to develop culturally relevant practices that build collaboration between the school, students' families, and community. Topics: Latino culture and history, school-parent communication.

Prerequisite: Enrollment is restricted to MA/credential students.

EDUC 213 - Child and Adolescent Development for Educators (2)

Offered in summer. Addresses theories of child and adolescent development and how these theories apply to student success in school. Topics include: cognitive, social, emotional, and physical development, and how this knowledge influences decisions teachers make about instruction and their interaction with students.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 214 - Contemporary Issues in Education (2)

Addresses current issues in California's educational landscape. Potential topics include the teaching of LGBTQ curricula, understanding youth gang participation, the initiation of ethnic studies courses, school funding and school district budgets, and new technologies for student assessment.

Prerequisite: Enrollment is restricted to MA/Credential graduate students.

EDUC 217 - Topics in Elementary Education: Physical Education (2)

Examines pedagogical understanding in teaching physical education. Introduces candidates to theoretical and research basis in physical education and content standards and frameworks. Also investigates and presents instructional practices.

Prerequisite: Enrollment is restricted to MA/credential students.

EDUC 218 - Topics in Elementary Education: Visual Arts (2)

Examines pedagogical understanding in teaching visual arts. Introduces candidates to theoretical and research basis for teaching visual arts and content standards and frameworks. Also investigates and presents instructional practices.

Prerequisite: Enrollment is restricted to MA/credential students.

EDUC 219 - Topics in Elementary Education: Performing Arts (2)

Examines pedagogical understanding in teaching performing arts. Introduces candidates to theoretical and research basis for teaching performing arts and content standards and frameworks. Also investigates and presents instructional practices.

Prerequisite: Enrollment is restricted to MA/credential students.

EDUC 220 - Reading and Language Arts for Elementary Classrooms (5)

This course provides both a theoretical and practical foundation for literacy instruction, emphasizing reading and language arts instruction in grades K–8. Interactive instruction and field experience will be used to examine curricula, methods, materials, and literacy evaluation.

Prerequisite: Enrollment is restricted to MA/credential students.

EDUC 221 - Science Learning and Teaching in Elementary Classrooms (5)

Examines constructivist and sociocultural approaches to the learning and teaching of science in elementary classrooms, including beliefs about the nature of science and theories of how children learn science. Provides a critical overview of curricula, instructional theories, and multiple approaches to teaching the big ideas in elementary science.

Prerequisite: Enrollment is restricted to MA/credential students.

EDUC 222 - Mathematics Learning and Teaching in Elementary Classrooms (5)

This course is required for the multiple subject credential. Examines constructivist and sociocultural approaches to the learning and teaching of mathematics in elementary classrooms, including the nature of mathematics and theories of how children learn mathematics. Provides an introduction to mathematics teaching standards and a critical overview of curricula, instructional theories, and multiple approaches to teaching the big ideas in elementary mathematics.

Prerequisite: Enrollment is restricted to MA/credential students.

EDUC 225 - Reading Across the Curriculum in Middle School and Secondary (5)

Provides a theoretical and practical foundation for teaching reading within content area instruction in middle school and secondary classrooms. Field experiences and interactive instruction will facilitate learning about strategies, curricula, methods, materials, and observation. Intended for students pursuing a single subject credential.

Prerequisite: Enrollment is restricted to MA/credential students.

EDUC 226 - English Teaching: Theory and Curriculum (5)

Required for the single subject English credential student. Examines sociocultural approaches to the learning and teaching of English in secondary classrooms, including theories of how children learn English language, literature, and composition.

Prerequisite: Enrollment is restricted to MA/credential students.

EDUC 227 - English Teaching for Secondary Classrooms (5)

Prepares English single subject credential candidates for student teaching in winter and spring. Course focuses on developing curricula and strategies in the content area. Through classroom placements, students observe and apply techniques to develop curriculum units used in student teaching.

Prerequisite: Enrollment is restricted to MA/credential students.

EDUC 228 - Math Education: Research and Practice (5)

Examines research on the learning and teaching of mathematics. Topics include the nature of mathematics cognition and learning, how children learn mathematics, mathematical discourse, and perspectives on addressing diversity in mathematics classrooms. Course is required for M.A./credential students in secondary (single subject) mathematics and of Ph.D. students in mathematics education.

Prerequisite: Enrollment is restricted to MA/credential students.

EDUC 229 - Teaching Mathematics in the Secondary Classroom (5)

Examines constructivist and sociocultural approaches to teaching mathematics in the secondary classroom. Course will provide an introduction to mathematics teaching standards and a critical overview of curricula, instructional theories, and multiple approaches to teaching the big ideas in secondary mathematics. Required for mathematics secondary credential.

Prerequisite: Prerequisite(s): EDUC 228. Enrollment is restricted to MA/credential students.

EDUC 230 - Science Education: Research and Practice (5)

Examines theoretical approaches to the learning and teaching of science including the nature of scientific knowledge, theories of how children learn science, approaches to scientific discourse, and perspectives on addressing diversity in science classrooms. Course is required for single subjects science credential.

Prerequisite: Enrollment is restricted to MA/credential students.

EDUC 231 - Teaching Science in the Secondary Classroom (5)

Examines constructivist and sociocultural approaches to teaching science in secondary classrooms. Course will provide a critical overview of curricula, instructional theories, and multiple approaches to teaching the big ideas in science.

Prerequisite: Enrollment is restricted to MA/credential students.

EDUC 232 - Social Science: Theory and Curriculum (5)

Required for the single subject social science credential student. Tracks both the implicit and explicit connections between theory and practice, illustrating that theory suggests best practice while practice informs theory-formation and testing.

Prerequisite: Enrollment is restricted to MA/credential students.

EDUC 233 - Social Science Teaching for Secondary Classrooms

(5)

Prepares social science single subject credential candidates for student teaching in winter and spring. Course focuses on developing curricula and strategies in the content area. Through classroom placements, students observe and apply techniques to develop curriculum units that are used in student teaching.

Prerequisite: Enrollment is restricted to MA/credential students.

EDUC 235 - Introduction to Educational Inquiry (5)

Addresses foundational knowledge needed to understand and conduct educational inquiry and research. Topics include epistemology in the human sciences, philosophical foundations of modern research strategies, and general classes of research investigations in education.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 236 - Quantitative Research Methods (5)

Provides an introductory-level knowledge of quantitative research methods in educational settings. Students learn the foundations of quantitative data theory, general logic behind statistical inference, and specific methods of data analysis in educational contexts.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 237 - Qualitative Research Methods (5)

Graduate level introduction to qualitative methods, with special attention to ethnographic research on schooling. Moves from overview of different methods, through examination of selected studies, to discussion of issues in research design, data collection, analysis, and writing.

Prerequisite: Enrollment is restricted to graduate students; priority is given to graduate students in education.

EDUC 250 - Teaching and Teachers (5)

Examines the historical, socio-political, and research contours of the teaching profession. Investigates histories of teaching and teacher's work in the 19th and 20th centuries. Analyzes the contemporary era of teachers and teaching in the United States.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 251 - Analysis of Activity and Interaction in Educational Settings (5)

Analyzes topics, which vary systematically from year to year, including analysis of classroom interaction, video recording and transcription, coding and analysis of discourse data, and software programs for qualitative analysis.

Prerequisite: Prerequisite(s): EDUC 237. Enrollment is restricted to graduate students.

EDUC 252 - Hermeneutics of Education (5)

Investigates philosophical hermeneutics to deeply interrogate education. Addresses such questions as: What is hermeneutics? How is education an hermeneutic enterprise? How does

knowing hermeneutics deepen the ability to engage in education research?

Prerequisite: Enrollment is restricted to graduate students.

EDUC 253 - Research Design in Mathematics and Science Education (5)

Examines multiple approaches to designing research studies in mathematics and science education. Introduces multiple types of research designs and principles used by education researchers examining mathematics/science learning and teaching.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 254 - Critical and Alternative Paradigms in Education Research (5)

Examines theoretical foundations of critical and alternative research paradigms commonly used in education, including critical ethnography, participatory research, counter-storytelling, and social-design experiments. Examines critiques of qualitative/quantitative research from feminist and critical theory; surveys how such critiques have informed the development of new paradigms in education research; and explores the benefits and limits of selected alternative paradigms.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 255 - Intermediate Quantitative Methods (5)

Focuses on the applied statistical modeling and analysis of educational data (large-scale data sets), not on the mathematical foundations of science. Students learn to address quantitative research questions using general linear model (GLM) statistical methods. GLM includes regression analysis, analysis of variance (ANOVA), and analysis of covariance (ANCOVA). Students learn statistics by doing statistics.

Prerequisite: Prerequisite(s): introductory statistics course (EDUC 236 or equivalent). Enrollment is restricted to graduate students.

EDUC 256 - Intermediate Qualitative Analysis (5)

Emphasizes the analysis of qualitative data in education research and introduces interpretive analytical approaches for its use with empirical data, the use of coding software for ethnographic analysis, and video recording and transcription.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 260 - The Teacher and The School: An Investigation of Related Practice, Reform, and Research (5)

Explores empirical and theoretical interconnections between teachers and teaching on the one side, and schools as situated organizations on the other. The course examines these various interconnections in relation to contemporary educational research, practice, and policy reform.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 261 - Thinking and Learning (5)

Examines multiple theoretical perspectives on thinking, learning, and teaching; the development of the whole person in a variety of cultural contexts; the roles thinking, learning, and teaching play in that development; and how researchers' and educators' conceptions shape instruction.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 262 - Social and Cultural Context of Education (5)

Application of anthropological and sociological theories to study of education. Examines social, cultural, and linguistic context of schooling with particular attention to role of race, class, culture, power, and language in influencing schooling outcomes.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 263 - Educational Reform (5)

Provides students with multiple analytic perspectives from which to examine important educational issues by analyzing political, historical, and philosophical origins of educational reform in the U.S. and internationally.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 264 - Research on Teacher Development and Teacher Education (5)

Addresses personal and professional development of teachers. Explores models of teacher education with specific attention to methods and processes by which teachers can be better prepared to work with culturally and linguistically diverse students.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 265 - Teacher as Educational Policy Maker (5)

Focuses on the role teachers play in making/implementing educational policy. Addresses how this topic is implicated in enhancing the educational opportunities available to students who, historically, have been underserved by schools.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 266 - Program Evaluation and Action Research in Educational Reform (5)

Overview of the purpose of and practice in program evaluations in a variety of contexts with a specific focus on educational settings. Students learn the techniques of program evaluation; the historical and theoretical context of program evaluations, including its relation to experimental research; and how action research can be used in conducting field-based evaluations. Students should be familiar with basic quantitative and qualitative methodologies.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 268 - Schools, Communities, and Families (5)

Examines the nexus of schools, communities, and families, and, in particular, how collaboration across institutional boundaries can facilitate school and community reform.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 271 - Theoretical Perspectives on Learning and Using Literacy (5)

Examines theoretical perspectives, educational issues, and scholarship related to use and development of literacy among diverse populations, particularly those who have not fared well in U.S. schools.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 272 - Language in Education and Society (5)

Investigates discipline of sociolinguistics and explores actual ways in which sociolinguistics has become a useful lens for better understanding teaching, learning, and schooling. Conduct own sociolinguistic analyses of data collected for culminating project.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 273 - Language Acquisition, Bilingualism, and Education (5)

Foundations of first- and second-language acquisition and bilingualism with emphasis on implications for education in linguistically diverse settings. Topics include linguistic, cognitive, sociolinguistic, and sociocultural approaches to development of languages and the nature of individual and societal bilingualism.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 274 - Language and Power in Education (5)

Examines relationships between sociopolitical struggles and language/language practices. Students study ways in which Marxism, critical theory, and post structuralism have represented links between language and power, and investigate contemporary studies of language and power in education.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 276 - Theory and Practice of Writing (5)

Explores first and second language-writing theory, research, and practice, especially relating to language minority students and others considered academically under-prepared. Focuses on educational settings from pre-school settings including families and communities.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 277A - Second-year Doctoral Proseminar (2)

Three-quarter seminar supporting second-year doctoral students as they progress through their second year research project from proposal, through data collection and analysis, to final paper and presentation.

Prerequisite: Prerequisite(s): Enrollment is restricted to education doctoral students working on their second-year project.

EDUC 277B - Second-year Doctoral Proseminar (2)

Three-quarter seminar supporting second-year doctoral students as they progress through their second year research project from proposal, through data collection and analysis, to final paper and presentation.

Prerequisite: Prerequisite(s): Enrollment is restricted to education doctoral students working on their second-year project.

EDUC 277C - Second-year Doctoral Proseminar (2)

Three-quarter seminar supporting second-year doctoral students as they progress through their second-year research project from proposal, through data collection and analysis, to final paper and presentation.

Prerequisite: Prerequisite(s): Enrollment is restricted to education doctoral students working on their second-year project.

EDUC 278 - Critical Exploration of Reading Theory and Practice (5)

Doctoral seminar that examines historical and current research on reading processes and instructional practices. Intensive study of factors affecting the development of proficient, engaged, and reflective readers who can acquire new knowledge from text.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 279 - Directed Reading (5)

Directed reading that does not involve a final paper. Students submit a petition to the course-sponsoring agency. May be repeated for credit up to four times. Enrollment is restricted to graduate students.

EDUC 279F - Directed Reading (2)

Directed reading that does not involve a final paper. Students submit a petition to the course-sponsoring agency. May be repeated for credit up to four times. Enrollment is restricted to graduate students.

EDUC 280 - Language and Literacy Across Disciplines (5)

Considers and critiques conceptualizations of the language used for academic pursuits, from the early years of schooling to higher education. Focuses on implications for research and practice related to the education of students in linguistically diverse schools and societies.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 281 - Conceptual Change in Science and Mathematics (5)

Examines approaches in cognitive science, mathematics education, and science education to documenting student conceptions in science and mathematics, defining conceptual change, and describing relationship between conceptual change and learning with understanding.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 282 - Informal Learning in Sciences and Mathematics (5)

Explores research on learning outside of school in multiple settings such as museums, after-school clubs, aquariums, workplaces, and homes. Readings draw from multiple fields and disciplines, including cognitive psychology, cognitive anthropology, cognitive science, education, museum education and evaluation, science, and mathematics education. Examine theoretical approaches to describing and understanding how people learn science and mathematics outside of school, empirical studies documenting learning in multiple non-school settings, and diversity issues in out-of-school settings.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 283 - Equity and Social Justice in Mathematics and Science Education (5)

Examines the theory, research, policy and practice of social justice and equity in mathematics and science education in local, national, and international contexts. Emphasizes the promotion of equity and critical mathematics and science literacy in schools and communities.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 284 - Gender in Mathematics and Science Education (5)

Explores basic aspects of gender in the fields of mathematics and science education. Discusses historical trends, current dilemmas, and how science and mathematics block or enable access for women.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 285 - Culture and Learning (5)

Examines multiple approaches to the study of the relation between culture and learning. Readings include historical and contemporary perspectives from cognitive science, cognitive anthropology, cross-cultural psychology, cultural psychology, and socio-cultural theories as frameworks for the study of culture and learning.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 286 - Research in STEM Education (5)

Focuses on particular issues of theoretical importance to research in mathematics and science education. Topics vary from year to year. Particular issues in cognition, learning, teaching, curriculum, and assessment in mathematics and science education may be covered.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 287 - Issues in Educational Assessment (5)

Familiarizes students with the basic concepts of educational assessment and explores issues related to the design and implementation of educational assessment as well as the application of educational assessment in educational research.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 288 - Ethnographies of Education (5)

Offers opportunity to critique a range of book-length ethnographic studies of education focusing on relationship between culture, learning, and schooling in the U.S. with comparative studies from other countries.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 289 - School Organization (5)

Applies multiple perspectives drawn from organizational theory, highlighting important aspects of organization of schools, including their operational environment, instructional organization, and professional and bureaucratic dimensions.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 290 - CHAT and Educational Practice and Research (5)

Introduction to cultural-historical activity theory (CHAT) based on work of Vygotsky, Bakhtin, and contemporary developments of their ideas. Explores the utility of CHAT as a framework for thinking about educational practice and research.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 291 - Globalization and Transnationalism in Education (5)

Examines educational access and advancement in several nations affected by globalization, national policies, and localized identity and opportunity structures. Attention to language and cultural expectations relevant to research in international contexts and how this knowledge provides reflection on the American condition.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 292 - Ideology and Education (5)

Philosophical study of the theory of ideology from Marx to the present and how ideologies (racism, sexism, classism, linguicism, abilityism) become embodied, reproduced, resisted, and transformed (and particularly the role of education therein).

Prerequisite: Enrollment is restricted to graduate students.

EDUC 293A - Research Apprenticeship (2)

Research apprenticeship under guidance of faculty member during first or second year of doctoral studies. May also be taken in the third year and beyond. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

EDUC 293B - Research Apprenticeship (5)

Research apprenticeship under guidance of faculty member during first or second year of doctoral studies. May also be taken in the third year and beyond. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

EDUC 294 - Second-Year Research Project (5)

Doctoral students work with faculty advisors to plan, carry out, and write up small independent research project during second year of graduate studies. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

EDUC 295 - Critical Perspectives on Education (5)

Investigates critical theories in education. Situates the themes against and within critical theory and philosophic foundations of Paulo Freire's theory of liberation education. Elaborates these themes within the discourses on critical race theory and education, and feminism and education.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 296 - Educational Policy and the Context of Teachers' Work (5)

Focuses on both the conceptual and methodological developments in the study of policy and on the research relation to the policy context of teachers' work.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 297 - Independent Study (5)

Students submit petition to sponsoring agency.

EDUC 297F - Independent Study (2)

Students submit petition to sponsoring agency.

EDUC 298 - TA Apprenticeship (2)

Students work with a faculty member who is teaching an undergraduate or MA/Credential course. Students will not be responsible for final grades, narrative evaluations, or holding discussion section. The expected course time commitment is limited to 2-3 hours per week, plus class meeting time. Students gain perspectives and practices of teaching undergraduate and graduate courses, working with the instructor on lesson planning, class instruction, and grading some student work.

Prerequisite: Enrollment is restricted to graduate students.

EDUC 299 - Thesis Research (5)

Students submit petition to sponsoring agency.

ENVS - ENVIRONMENTAL STUDIES

Lower-Division

ENVS 15 - Natural History of the UCSC Campus (2)

Introduces students to the range of natural species and communities occurring on the UCSC campus. All class time is spent outside, and each week a different area of campus is visited. Course 24 is recommended.

ENVS 17 - Curation of Natural History Collections (2)

Introduction and training in the skills needed to create, manage, and exhibit natural history collections, including plants, insects, fungi, birds, mammals, reptiles, and amphibians.

ENVS 18 - Natural History Illustration (5)

Students gain proficiency in illustration media, and acquire training in the essential skills needed to create natural-history

inspired illustrations. Students create illustrations and paintings by studying organisms in the Norris Center for Natural History collections, as well as those living on and around campus. Some experience in basic drawing and/or natural-history sketching is recommended.

ENVS 19 - Topics in Natural History (3)

Students learn the fundamentals of organismal biology and ecology through observations in the field, museum specimens, and field journaling. Class focuses on a particular taxonomic group or natural community, such as reptiles, fungi, insects, coastal prairie, or chaparral. Enrollment by application. Please email envsadvi@ucsc.edu for applications.

ENVS 23 - The Physical and Chemical Environment (5)

Provides an overview of the physical and chemical environment of planet Earth. Fundamental chemistry and physics is introduced in the process of learning about Earth in a holistic way. The influence of human societies on the global environment is one focus of discussion. Earth's many spheres are explored first: the lithosphere; the atmosphere; the hydrosphere, and the ecosphere. Then global cycles of carbon, nitrogen, and several other elements are studied in the context of basic sciences and societal issues.

ENVS 24 - General Ecology (5)

Covers principles of ecology including limits to species abundances, evolutionary ecology, population dynamics, community interactions and patterns, and ecosystem patterns and dynamics.

Prerequisite: Prerequisite(s): AM 3 or AM 6, or MATH 3 or higher; or mathematics placement examination (MPE) score of 300 or higher; or AP Calculus AB exam score of 3 or higher; ENVS 23 recommended as prerequisite to this course.

ENVS 25 - Environmental Policy and Economics (5)

Introduces the policy and economic dimensions of some pressing environmental challenges. Case studies may include, biodiversity conservation, waste, water, climate change, and other topics to examine the drivers and policy responses to environmental problems and the trade-offs in different policy solutions.

ENVS 65 - Introduction to Fresh Water: Processes and Policy (5)

Introduction to freshwater resources from multiple scientific and policy perspectives. After a review of basic concepts, water issues affecting cities, farms, open space, and multiple-use landscapes are studied. Students cannot receive credit for this course if they have previously received credit for ENVS 165.

ENVS 80B - The Ecological Forecast for Global Warming (5)

A broad overview of the impacts of human activities on the global climate system. Topics include how climate affects the distribution of ecosystems, the influence of global climate change on biodiversity, ecosystem function, and consequences for the human enterprise.

ENVS 80C - Climate Change Science and Policy (5)

An interdisciplinary overview of the science and policy of global climate change. Topics include Earth system science, climate change impacts on the environment, climate change policy, and the future of climate change politics from the local to the global.

ENVS 80F - Introduction to Agroecology and Sustainable Food Systems (5)

Our current food system is unsustainable for the environment and unjust for the farmers, farmworkers, and consumers who depend on it. Course provides an interdisciplinary, experiential, and systems-focused introduction to agroecology and other approaches to advancing a more just and ecologically sustainable food system. Students will come to understand agroecology as a science for understanding agricultural ecosystems, as a farming practice, and as a social movement to change the way we produce and distribute/access food. Course examines many topics—including biological fertility and pest management, seeds, livestock raising, and aquaculture—from the perspective of both the natural and social sciences, leaving students with a perspective that transcends any particular academic discipline. Students gain hands-on experience with farming research, production, and food distribution happening across the UCSC campus farm and food system.

ENVS 83 - Environmental Studies Internship (5)

A supervised off-campus learning experience related to environmental problem solving. Focuses on initial experiences in applied work and specific skill development. Students may be placed individually or with a team in government agencies, private organizations, citizen action groups.

ENVS 99 - Tutorial (5)

Directed reading, supervised research, and organized projects relating to environmental problems. May be repeated for credit with consent of the chairperson of Environmental Studies Department. Students submit petition to sponsoring agency.

ENVS 99F - Tutorial (2)

Provides for department-sponsored directed reading, supervised research, or organized project for lower-division students under the direct supervision of a faculty sponsor. May not be counted toward major requirements. Students submit petition to sponsoring agency.

Upper-Division**ENVS 100 - Ecology and Society (3)**

Introduction to environmental issues in an interdisciplinary matrix. Focuses on three issues at the intersection of ecological questions and social institutions: agroecology and sustainable agriculture; population growth, economic growth, and environmental degradation; and biodiversity conservation and land management. Reviews the important roles of disciplinary abstraction and of the application of that knowledge to context-dependent explanations of environmental problems.

Prerequisite: Prerequisite(s): ENVS 23 or CHEM 1A; ENVS 24 or BIOE 20C; ENVS 25; and STAT 7 and STAT 7L, or ECON 113 or OCEA 90; and one from: ANTH 2, SOCY 1, SOCY 10, SOCY 15, PHIL 21, PHIL 22, PHIL 24, PHIL 28, or PHIL 80G. Concurrent enrollment in ENVS 100L is required.

ENVS 100L - Ecology and Society Writing Laboratory (5)

Required writing lab accompanying course 100. Students are introduced to writing in different styles and for different audiences typical of the ecosystem-society interface. Course 100 writing assignments are developed, written, and revised in conjunction with the lab. W credit is granted only upon successful completion of ENVS 100.

Prerequisite: Prerequisite(s): Satisfaction of the Entry Level Writing and Composition requirements. Concurrent enrollment in ENVS 100 is required.

ENVS 104A - Introduction to Environmental Field Methods (5)

A course in the process of field research and monitoring, with emphasis on use of the scientific method; experimental design, data handling, statistical analysis and presentation; and basic field methodologies. Application of basic field skills, including habitat description; methods for sampling plants, animals, soils, water, and microclimate; and observational and manipulative techniques to address ecological, conservation, and management questions.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; concurrent enrollment in ENVS 104L and previous or concurrent enrollment in ENVS 100 and ENVS 100L is required, or by permission of instructor.

ENVS 104L - Field Methods Laboratory (2)

Students directly observe elements of natural history and ecological process; design and implement field studies based on lectures; deploy the methods discussed in lectures; and collect data to analyze, interpret, and report in written and oral forms.

Prerequisite: Concurrent enrollment in ENVS 104A is required.

ENVS 106A - Natural History of Birds (5)

The evolution, taxonomy, physiology, behavior, ecology, and management of birds. Lecture, discussion, field format. Birds observed in habitats including bay, marsh, meadow, and forest. Evaluations based on a field journal and examinations.

Prerequisite: Prerequisite(s): previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor. ENVS 105 or BIOL 138 are recommended.

ENVS 106M - Natural History of Birds Laboratory (2)

A field course designed to complement ENVS 106A by providing students with the opportunity to gain direct experience in bird study. This includes participation in field exercises and trips to off-campus sites in the region.

Prerequisite: Prerequisite(s): Concurrent enrollment in ENVS 106A is required.

ENVS 107A - Natural History Field Quarter (5)

A 15-unit field course that uses California wild lands to develop skills of natural history observation and interpretation. Students gain the ability to identify plants, animals, vegetation types, and landscapes, as well as address the complex issues of preservation and management of these resources. Enrollment by interview. Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L; concurrent enrollment in ENVS 107B and ENVS 107C required. Students are billed a materials fee.

ENVS 107B - Natural History Field Quarter (5)

A 15-unit field course that uses California wild lands to develop skills of natural history observation and interpretation. Students gain the ability to identify plants, animals, vegetation types, and landscapes, as well as address the complex issues of preservation and management of these resources. Enrollment by interview. Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L; concurrent enrollment in courses ENVS 107A and ENVS 107C required.

ENVS 107C - Natural History Field Quarter (5)

A 15-unit field course that uses California wild lands to develop skills of natural history observation and interpretation. Students gain the ability to identify plants, animals, vegetation types, and landscapes, as well as address the complex issues of preservation and management of these resources. Enrollment by interview. Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L; concurrent enrollment in courses ENVS 107A and ENVS 107B required.

ENVS 108 - General Entomology (5)

Introduction to entomology including anatomy, physiology, systematics, evolution, behavior, and reproduction of the world's most diverse group of organisms. These topics are illustrated in several contexts, from the importance of insects as disease vectors to the historical and contemporary uses of insects by humans.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L required, or by permission of instructor.

ENVS 108L - General Entomology Laboratory (3)

Laboratory sections are devoted to the identification of insects. Individual collections representing 15 orders, sight identification of 60 families, and use of taxonomic keys for positive designations required.

Prerequisite: Concurrent enrollment in ENVS 108 is required.

ENVS 110 - Institutions, the Environment, and Economic Systems (5)

Debate about environmental policy is often couched in economic terms. Environmental issues have become questions of political economy, as they influence international and

domestic policy and reflect on the functioning of the market system. Examines the assumptions and implications of alternative approaches to political economy, as these pertain to questions of environmental policy and political institutions.

Prerequisite: Prerequisite(s): previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 115A - Geographic Information Systems and Environmental Applications (5)

Introduction to geographic information systems (GIS) as the technology of processing spatial data, including input, storage and retrieval; manipulation and analysis; reporting and interpretation. Emphasizes GIS as a decision support system for environmental and social problem solving, using basic model building, experimental design, and database management. Taught in conjunction with ENVS 215A. Students cannot receive credit for this course and ENVS 215A.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 115L and ENVS 100 and ENVS 100L, or permission of instructor. Course in computer science, Earth science, math, or geography recommended.

ENVS 115B - Intermediate Geographic Information Systems (GIS) (5)

Evaluates advanced technologies of processing spatial data, spatial theory, and application to unique geographic problems, data manipulation and analysis, and reporting and interpretation. Emphasizes GIS as a decision-support system for environmental and social problem solving, using basic model building, experimental design, and database management. Taught in conjunction with ENVS 215B. Students cannot receive credit for this course and ENVS 215B.

Prerequisite: Prerequisite(s): ENVS 115A, ENVS 100, and ENVS 100L. A previous course in computer science, Earth science, mathematics, or geography is recommended.

ENVS 115C - Advanced Geographic Information Systems (5)

Explores more advanced training in spatial theory and methods and their application to unique geographic problems. Emphasis given to advanced aspects of spatial data analysis and building custom GIS solutions.

Prerequisite: Prerequisite(s): ENVS 115A and ENVS 115B. Enrollment is restricted to sophomores, juniors, and seniors.

ENVS 115L - Exercises in Geographic Information Systems (2)

Exercises in Geographic Information Systems and Remote Sensing that demonstrate the development of digital geographic data. Students gain hands-on experience with developing datasets, using imagery to create GIS layers, performing spatial analysis, and utilizing GPS technology. Emphasis placed on environmental applications. Students cannot receive credit for this course and ENVS 215L.

Prerequisite: Concurrent enrollment in ENVS 115A required.

ENVS 120 - Conservation Biology (5)

Introduces biological and anthropogenic influences on the diversity and scarcity of organisms. Explores the mathematical models and research tools that provide the foundation for many conservation and management decisions regarding endangered and/or declining species. Topics explored in the context of various examples of conservation decision-making in the real world.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 121 - Landscape Ecology (5)

Investigates topics about the causes and consequences of spatial heterogeneity and pattern in natural- and human-dominated systems. This course provides a foundational understanding of how landscape pattern is generated and relates to populations, communities, and ecosystem processes.

Prerequisite: Prerequisite(s): previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of the instructor.

ENVS 122 - Tropical Ecology and Conservation (5)

An introduction to the ecological processes, principles, and players of tropical ecosystems, and to conservation issues facing tropical American forests. We will look at how tropical ecosystems work, roles of humans in shaping them, and current conservation opportunities and dilemmas.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 123 - Animal Ecology and Conservation (5)

Advanced course in animal ecology and conservation focusing on the ecology, behavior, biogeography, and evolution of vertebrates.

Prerequisite: Prerequisite(s): ENVS 120. Previous or concurrent enrollment in ENVS 100 and ENVS 100L; or by permission of instructor.

ENVS 129 - Integrated Pest Management (5)

Provides an extensive coverage of applied ecology, pest control technology, and the social, political, and economic factors regulating the ideologies and practice of pest management. Topics include agroecosystem design and population regulation of insects, weeds, vertebrates, and pathogens; field monitoring, chemical and biological control; economic thresholds, decision-making processes, and the role of agribusiness.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 129L - Integrated Pest Management Laboratory (2)

Field trips and field exercises that demonstrate the practice of integrated pest management techniques. Individual and group projects provide hands-on experience with field sampling techniques, pest identification, recognition of biological control

agents, experimental design, interview techniques, data interpretation and field report writing.

Prerequisite: Prerequisite(s): concurrent enrollment in ENVS 129.

ENVS 130A - Agroecology and Sustainable Agriculture (5)

Ecological concepts and principles are applied to the design and management of sustainable agroecosystems. Alternatives for agriculture are discussed in terms of ecosystem structure and function. A weekly three-hour lab is required.

Prerequisite: Prerequisite(s): Concurrent enrollment in ENVS 130L and previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 130B - Justice and Sustainability in Agriculture (5)

Agricultural sustainability is examined as a complex set of interactions between ecological, social, and economic factors. Drawing case studies from U.S. agriculture, course examines the social justice implications of historical and current agri-food system dynamics. (Formerly Principles of Sustainable Agriculture.)

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 130C - Field Experiences in Agroecology and Sustainable Food (5)

Research and practice in agroecology and sustainable food systems. Students gain multidimensional understanding of agroecology through study at the UCSC farm, guest speakers, field trips, and interdisciplinary readings. Students participate in research projects and learn about methods, and study design and statistical analysis. Students are billed a materials fee.

Prerequisite: Prerequisite(s): previous or concurrent enrollment in ENVS 100 and ENVS 100L.

ENVS 130L - Agroecology and Sustainable Agriculture Laboratory (2)

Laboratory and field exercises to train in the analysis of ecological processes in agricultural systems, with a focus on the quantification of ecological sustainability. Experimental design, analysis, and data interpretation are emphasized. Students are billed a materials fee.

Prerequisite: Concurrent enrollment in ENVS 130A is required.

ENVS 131 - Insect Ecology (5)

Advanced course in ecology featuring insect-plant interactions such as herbivory, pollination, and the effects of plants on insect population dynamics. Lectures emphasize current controversies in ecological theory and relate theory to application.

Prerequisite: Prerequisite(s): previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 133 - Agroecology Practicum (5)

Lectures and demonstrations are combined with field applications to give students direct experience and knowledge of sustainable agriculture and horticulture practices and principles. UCSC Farm and Garden are the living laboratories for testing agroecological principles. Emphasis is placed on small-farm systems. May be applied to major only once. Students are billed a materials fee.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 135 - Sustainable Aquaculture (5)

Current international and local aquaculture systems and science and practices needed to steer them toward sustainability. Critically looks at practices, analyzes environmental, social, economic, and human health effects of sustainable systems. Includes UCSC Aquaculture lab, farm visits, private sector, guests.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L.

ENVS 138 - Field Ethnobotany (5)

Lectures, laboratory, and fieldwork examine field botany from a human ecology perspective. Students have the opportunity to learn the skills of field botany and plant identification through the study of plants that are of major significance for human cultures. The emphasis of field skills is on applications to sustainable management of natural resources.

Prerequisite: Prerequisite(s): ENVS 130A and ENVS 130L, or by permission of instructor. Concurrent enrollment in ENVS 138L required.

ENVS 140 - National Environmental Policy (5)

An overview of all major federal environmental policy domains. Analyzes political, social, economic, and other forces influencing federal (and some state) public policy responses to land use, natural resources, pollution, and conservation dilemmas.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 141 - Ecological Economics (5)

Application of economic analysis to natural resource policy and management. Topics include welfare economics, property rights and externalities, natural resource valuation, exhaustible and renewable resources, and sustainable development.

Prerequisite: Prerequisite(s): ECON 1 is strongly recommended as preparation. Previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 142 - Sustainable Energy (5)

Explores the renewable and fossil fuel energy resources, with an emphasis on interactions with food and water systems. Explores opportunities for improving efficiency, reducing pollution, and increasing access through technology advances,

policy, and consumer decisions. (Formerly Energy Politics and Policy.)

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 143 - Sustainable Development: Economy, Policy, and Environment (5)

Considers whether and how global poverty can be alleviated without irreparably damaging the environment. Examines interactions among population, economic growth, poverty, global consumption ethos, property rights systems, global economy, state capacity, and environmental damage. Scrutinizes impact of various developmental strategies adopted during the past 50 years on poverty, governance, and the environment.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 144 - Global Climate Change Politics (5)

Explores the central political questions surrounding global governance of climate change. Focuses on how climate change is governed within the United Nations system, and, in particular, explores issues of equity and justice in terms of how we address climate change.

Prerequisite: Prerequisite(s): Environmental Studies students, previous or concurrent enrollment in courses ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 145 - Green Cities (5)

Are cities an environmental savior or an engine of pollution? This course considers what makes a truly green city and analyzes innovative urban policies in areas such as energy, transportation, buildings, and waste management.

Prerequisite: Prerequisite(s): previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of the instructor.

ENVS 146 - Water Quality: Policy, Regulation, and Management (5)

Building on prior preparation, the course provides an in-depth examination of American water-quality policy, regulation and management. In addition to a detailed understanding of pollutant-discharge permitting, students learn about nonpoint source water pollution and its regulatory remedies.

Prerequisite: Prerequisite(s): ENVS 100 and ENVS 100L; and ENVS 140, ENVS 149, ENVS 150 or ENVS 165.

ENVS 147 - Environmental Inequality/Environmental Justice (5)

Reviews research on race, class, and differential exposure to environmental hazards. Shows how environmental inequality has, from the start, been an essential feature of modernity. Situates the environmental-justice movement in the history of American environmentalism.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 149 - Environmental Law and Policy (5)

Surveys a wide range of topics in environmental law, including state and federal jurisdiction, administrative law, separation of powers, state and local land use regulation, public land and resource management, pollution control, and private rights and remedies. Students read a large number of judicial cases and other legal documents.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 150 - Coastal and Marine Policy (5)

Examines key legal, policy, and institutional frameworks that govern the use and stewardship of coastal and marine areas and resources. Primary focus is on the U.S., although attention is also devoted to international laws and institutions.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENV 100 and ENVS 100L, or by permission of instructor.

ENVS 151 - Environmental Assessment (5)

Introduction to California land use planning law and practice, and the theory, practice, and public policy aspects of environmental assessment, using the California Environmental Quality Act (CEQA) as a model. The National Environmental Policy Act (NEPA) and other environmental and planning legislation also considered. Covers elements of State law and regulations, environmental impact assessment requirements, and practical procedures for preparing and evaluating CEQA documents, with case studies that exemplify legal, regulatory and public policy and practice aspects of the assessment process.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 152 - International Environmental Politics (5)

Examines international law and politics through the lens of cooperation on transboundary environmental problems, ranging from acid rain to toxic chemicals to biodiversity loss and climate change, which have become pressing political concerns in our increasingly globalized economy.

Prerequisite: Prerequisite(s): previous or concurrent enrollment in courses ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 153 - Globalization and the Environment: Trade Complements and Conflicts (5)

Explores the relationship between international trade and environmental protection. Centrally, we will consider the question: are trade liberalization and environment protection antithetical or conducive? We will use the theoretical literature on regime overlap to help us better consider this question.

Prerequisite: Prerequisite(s): previous or concurrent enrollment in courses ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 154 - Amazonian Cultures and Conservation (5)

Overview of human societies in the Amazon from both a historical and contemporary perspective. Topics include indigenous resource management, deforestation, conservation politics, culture, and economic change.

Prerequisite: Prerequisite(s): previous or concurrent enrollment in ENVS 100 and ENVS 100L, or permission of instructor.

ENVS 156 - Environmental Action Through Writing (5)

Guided practice in writing skills useful to environmental activists. Assignments emphasize thinking quickly, revising adeptly, researching resourcefully, and tempering powerful passions with careful arguments. Toward the development of effective individual voices, students read each other's drafts as well as the published work of established writers. Enrollment priority will be given to students who have not taken course 157.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements and previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 157 - Writing in the Natural Sciences (5)

Guided practice in writing effectively about science and natural history for a variety of audiences. Assignments emphasize reporting first-hand observations, explaining processes and phenomena, understanding scientific papers, and writing about scientific and technical subjects for a general audience. Enrollment priority will be given to students who have not taken course 156.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements and previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 158 - Political Ecology and Social Change (5)

The object is to provide a rigorous grounding in the method of political ecology and to demonstrate how this approach has been used in environmental analysis and problem solving by environmental social movements.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 159 - Nature Literature (5)

Introduction to 19th- and 20th-century American writers who have influenced our understanding of humans' place in the natural world. Readings include original works as well as biographical and critical texts. Discussions, field trips, and writing assignments emphasize active learning.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 160 - Restoration Ecology (5)

A multidisciplinary overview of restoring degraded ecosystems. Among the topics addressed are linkages between ecological

principles and restoration, planning and implementing restoration projects, evaluating restoration success, and case studies of restoration of specific ecosystem types. Participation in one work day is required.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 161A - Soils and Plant Nutrition (5)

Provides fundamentals of soils and plant nutrition. The physical, biological, and chemical components of soils are investigated in relation to their ecological functions, fertility to plants, and sustainable management.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 162 - Plant Physiological Ecology (5)

Describes how the environment affects plants through the linkages between water, energy, nutrients, photosynthesis, and plant growth. Demonstrates how plant recruitment, survival, and reproduction affect conservation and agriculture. Prior coursework in ecology and/or plant physiology is recommended.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 162L - Plant Physiological Ecology Laboratory (2)

Introduces techniques for the study of plant interactions with the physical environment. Examines the role of stress on energy budgets, water relations, photosynthesis, and reproductive allocation. Emphasizes experimental design, field techniques, and instrumentation during field trips to local chaparral and grassland ecosystems.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 163 - Plant Disease Ecology (5)

Introduction to ecological roles of plant diseases, including their importance in regulating plant population dynamics, community diversity, and system function in natural ecosystems; considerations of plant diseases in conservation ecology; and ecological approaches to managing diseases in agroecosystems. Students cannot receive credit for this course and ENVS 263.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 163L - Plant Disease Ecology Lab (2)

Introduction to techniques for studying plant diseases, including detection, isolation, cultivation, and identification of important groups of plant pathogens, completing Koch's postulates; diseases assessment techniques; experimental manipulation of plant-pathogen systems; and basic epidemiological tools. One field trip required.

Prerequisite: Prerequisite(s): concurrent enrollment in ENVS 163 is required.

ENVS 164 - Projects and Practices in Soil Ecology (5)

Students learn soil ecological principles by carrying out inquiry-based projects and practices in land ecosystems (agroecosystems, forests and grasslands). UCSC reserves, farms, gardens, and greenhouses are the default living-laboratories for the course. The emphasis is on experiential learning of practical and technical skills in using soil methods.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of the instructor. Previous enrollment in ENVS 161A is recommended.

ENVS 165 - Sustainable Water Systems (5)

Concepts, vocabulary, and skills necessary to the analysis of freshwater issues are introduced from hydrology, ecology, law, economics, engineering, and other disciplines. The skills are then applied to case studies involving local, state, and international freshwater conflicts and crises. (Formerly Freshwater Issues and Policy.)

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 166 - Agroecosystem Analysis and Watershed Management (5)

Explores a range of approaches to examine agroecosystem function, watershed management, and concepts of sustainability. Uses a combination of lecture, demonstration, field work, and field trips to illustrate approaches to analysis of managed ecosystems behavior and the integration of biophysical and socio-political knowledge to aid in watershed management.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor; and ENVS 130A or ENVS 130B or ENVS 129 or ENVS 133 or ENVS 160 or ENVS 167.

ENVS 167 - Freshwater and Wetland Ecology (5)

Field and lecture course teaches the physical and biological patterns and processes in freshwater and wetland systems, primarily focusing on Central Coast systems from headwaters to coastal marshes.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 167L - Freshwater and Wetland Ecology Lab (2)

Provides basic skills to assess chemical, biological, and physical characteristics of freshwater creeks, rivers, and wetlands. These skills are needed in environmental consulting, municipal agencies engaging in water management or impacts on water, and regulatory agencies. Relies on methods in geomorphology, biogeochemistry, hydrology, and field biology.

Prerequisite: Concurrent enrollment in ENVS 167 is required.

ENVS 168 - Biogeochemistry and the Global Environment (5)

Studies biogeochemical cycles and related environmental issues such as global environmental change, eutrophication, ecosystem degradation, and agricultural sustainability. Discusses transformation and movement of major nutrient elements in context of watershed ecology and societal implications. Students cannot receive credit for this course and ENVS 268.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L required, or by permission of instructor.

ENVS 169 - Climate Change Ecology (5)

Advanced topics in atmospheric science and ecological theory. Topics include impacts on biodiversity, carbon sequestration, sustainable agriculture, and innovative solutions.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L required, or by permission of instructor.

ENVS 170 - Agriculture and Climate Change (5)

Agriculture contributes to and is affected by climate change. Through lectures and field trips, this course covers the impacts on crops and livestock; climate adaptation strategies in the United States and internationally; and agricultural policy responses to climate change.

Prerequisite: Prerequisite(s): previous or concurrent enrollment in ENVS 100 and ENVS 100L.

ENVS 171 - Topics in Environmental Studies (5)

Readings and discussions of primary literature on a current environmental topic. Emphasizes experiential learning and research. The topics vary; consult current course listings.

Prerequisite: Prerequisite(s): ENVS 100 and ENVS 100L, or by permission of the instructor.

ENVS 172 - Environmental Risks and Public Policy (5)

Introduces students to the dilemmas in public policy relating to the management of environmental risks, and discusses their underlying philosophical underpinnings. Explores emergent alternatives, such as the precautionary principle and alternatives assessment, and examines the relationship between experts and the lay public in public controversies.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 173 - An Introduction to World Environmental History (5)

Introduces students to some of the central issues in world environmental history such as: human attitudes toward the natural environment; the role of human societies, their institutions and technologies in changing the face of the earth; and the historical impact of environmental and developmental policies on race, class, and gender differences in a variety of human communities across the world.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 176 - Vulnerability, Complex Systems, and Disasters (5)

Introduces students to the research on the relationship between vulnerability and disasters, and on complex systems including hazardous technologies. Explores perspectives on disasters in the literature on political ecology. Also examines relevant work of organizational sociology, and related fields including normal accident and high reliability organizational theories.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L, or by permission of the instructor.

ENVS 177 - Teaching Environmental Education (5)

Designed for environmental studies majors interested in teaching environmental education in the K-12 school system. Students investigate incorporation of environmental education in the classroom; design an environmental education school project; and are placed in a school where they observe environmental education in practice.

Prerequisite: Prerequisite(s): previous or concurrent enrollment in courses ENVS 100 and ENVS 100L, or by permission of instructor.

ENVS 179 - Environmental Interpretation (5)

A field course in theory and practice of environmental interpretation in parks, museums, and school programs with special attention to local natural history and children. Students work to define their own interpretive philosophy, skills, and style. A background in natural history and/or experience working with children is recommended.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in ENVS 100 and ENVS 100L or by permission of instructor. Enrollment in ENVS 184 is highly recommended.

ENVS 183 - Environmental Studies Internship (5)

A supervised off-campus learning experience related to environmental problem solving. Students may work with government agencies, private organizations, citizen action groups, or in specialized apprenticeships on an individual or team basis. A significant, independently researched project is required. Internship intended for environmental studies majors. Prerequisite(s): previous or concurrent enrollment in ENVS 100 and ENVS 100L, and by permission of instructor. Students submit petition to course sponsoring agency.

ENVS 183A - Senior Internship (5)

First quarter of two-quarter senior internship exit requirement. Supervised off-campus learning experience related to environmental problem-solving. Students may work with government agencies, private organizations, citizen action groups, or in specialized apprenticeships on an individual or team basis. Students submit petition to course-sponsoring agency. Enrollment is restricted to environmental studies majors and the combined majors with Earth science, biology, and economics. Enrollment is by permission of instructor.

ENVS 183B - Senior Internship (5)

This course combines fieldwork at an off-campus agency and a comprehensive analytical paper produced for the agency. Equivalent to a thesis in terms of the depth and quality of the work expected. Prerequisite(s): ENVS 183A. Students submit petition to course-sponsoring agency. Enrollment is restricted to environmental studies majors and the combined majors with Earth sciences, biology, and economics.

ENVS 184 - Environmental Studies Internship (2)

Supervised learning experience related to environmental problem solving. Students may work with government agencies, private organizations, citizen action groups, or in specialized apprenticeships on an individual or team basis. This 2-credit internship puts students in the field and offers them the experience of practicing environmental problem solving. This internship experience focuses on specific skill development.

ENVS 189 - Environmental Studies Research Seminar (1)

Research seminars presented weekly throughout the year by environmental studies faculty, visiting scholars, and graduate students. Students discuss content and methodology of research presented following each seminar. Students write critiques of some seminars.

ENVS 190 - Capstone Course: Environmental Problem Solving (5)

A synthetic course that draws on the knowledge and skills students bring from other courses in the major. Focuses on written and oral individual and group projects in which students must take the initiative. Emphasizes developing skills critical for students in their future careers.

Prerequisite: Prerequisite(s): ENVS 100 and ENVS 100L; Entry Level Writing and Composition requirements. Enrollment is restricted to senior environmental studies majors and the combined majors with Earth sciences, biology, and economics.

ENVS 191F - Community and Agroecology Seminar (2)

Interdisciplinary two-credit seminar designed for upper-division students who want to become involved in PICA (Program in Community and Agroecology) and to explore concepts of community and agroecology as they relate to sustainability. Also emphasizes development of leadership skills. Specific topics and readings change each quarter.

Prerequisite: Prerequisite(s): ENVS 91F, ENVS 130A, ENVS 130B, or ENVS 133, or equivalent experience.

ENVS 192 - Directed Student Teaching (5)

Teaching a lower-division seminar. (See ENVS 42.) Prerequisite(s): upper-division standing; permission of environmental studies faculty member and chairperson of department.

ENVS 194 - Teaching Environmental Studies (5)

This provides an opportunity to participate in the preparation and teaching of introductory environmental studies courses. Students will have significant responsibility in leading

discussion sections. Students submit petition to sponsoring agency.

ENVS 194F - Teaching Environmental Studies (2)

Students facilitate discussions of course material in an introductory environmental studies course in conjunction with faculty and teaching assistants. May not count toward upper-division major requirements. Approval of the sponsoring agency and selection by the primary instructor of specific courses is required.

ENVS 195A - Senior Research (5)

First of a two-quarter senior thesis that results in drafting key thesis elements. Completion of this course does not satisfy the senior exit requirement. Continuation into 195B is contingent upon instructor approval after satisfactory completion of this course. Prerequisite(s): Completion of ENVS 100 and ENVS 100L, and Entry Level Writing and Composition requirements.

ENVS 195B - Senior Thesis Group (5)

Individually supervised senior research that results in a senior thesis. Must meet regularly with faculty sponsor to discuss progress of the project, and to receive academic and technical guidance. Students must submit electronic copies of the completed research and write-up. Satisfies the senior comprehensive requirement. Prerequisite(s): Completion of ENVS 100 and ENVS 100L and ENVS 195A.

ENVS 196 - Senior Seminar (5)

Readings and discussions of primary literature on a current environmental studies topic. Field or literature-based research projects (individual or group) writing multiple drafts resulting in a final paper. Topics vary yearly; consult current course listings. Enrollment by application with selection based on appropriate background and academic performance and by consent of instructor. Satisfies senior comprehensive requirement. Enrollment restricted to senior environmental studies majors; senior environmental studies/biology combined majors; senior environmental studies / Earth sciences combined majors; and senior environmental studies /economics combined majors. Prerequisite(s): Entry Level Writing and Composition requirements.

ENVS 199 - Tutorial (5)

Advanced directed reading, supervised research, and organized projects relating to environmental problems. May be repeated for credit with consent of the chair of environmental studies. Students submit petition to sponsoring agency. Prerequisite(s): prior or concurrent enrollment in ENVS 100 and ENVS 100L.

ENVS 199F - Tutorial (2)

Provides for department-sponsored directed reading, supervised research, or organized project under the direct supervision of a faculty sponsor. May not be counted toward major requirements. Students submit petition to sponsoring agency.

Graduate**ENVS 201A - Research Approaches in Environmental Studies**

(5)

The first course of a two-quarter sequence that explores the range of scholarly traditions that inform the kinds of research common to the Environmental Studies Department at UCSC.

Prerequisite: Enrollment is restricted to graduate students.

ENVS 201B - Environmental Studies In Practice (5)

The second course in a two-quarter sequence that is designed for beginning graduate students in environmental studies and in any other related field. Introduces interdisciplinary approaches of environmental studies and is an experiential, hands-on class focused on a specific environmental problem.

Prerequisite: Enrollment is restricted to graduate students.

ENVS 210 - Political Ecological Thought and Environment (5)

Provides an introduction to social scientific analyses of the relationships between capitalistic development and the environment in the late 20th century. It has a dual purpose: First, to develop a contemporary historical understanding and sensibility of how economic change, new institutional configurations, and world scale processes are shaping interactions with the environment. Second, to examine some recent political social theoretical perspectives on nature-society relations and radical environmental and social movements.

Prerequisite: Enrollment is restricted to graduate students in environmental studies.

ENVS 215A - Geographic Information Systems and Environmental Applications (5)

Introduction to geographic information systems (GIS) as the technology of processing spatial data, including input, storage and retrieval; manipulation and analysis; reporting and interpretation. Emphasizes GIS as a decision support system for environmental and social problem solving, using basic model building, experimental design, and database management. Students cannot receive credit for this course and ENVS 115A.

Prerequisite: Concurrent enrollment in ENVS 215L is required. Enrollment is restricted to graduate students.

ENVS 215B - Intermediate Geographic Information Systems (5)

Evaluates advanced technologies of processing spatial data, spatial theory, and application to unique geographic problems, data manipulation and analysis, and reporting and interpretation. Emphasizes GIS as a decision-support system for environmental and social problem solving, using basic model building, experimental design, and database management. Taught in conjunction with ENVS 115B. Students cannot receive credit for this course and ENVS 115B.

Prerequisite: Prerequisite(s): ENVS 215A. Enrollment is restricted to graduate students.

ENVS 215L - Exercises in Geographic Information Systems (2)

Exercises in Geographic Information Systems and Remote Sensing that demonstrate the development of digital geographic data. Students gain hands-on experience with developing

datasets, using imagery to create GIS layers, performing spatial analysis, and utilizing GPS technology. Emphasis placed on environmental applications. Students cannot receive credit for this course and ENVS 115L.

Prerequisite: Concurrent enrollment in ENVS 215A is required. Enrollment is restricted to environmental studies graduate students.

ENVS 220 - Conservation Biology (5)

The principles of conservation biology, including a review of the core disciplines of demography, population genetics, island biogeography, and community ecology and discussion of area and edge effects, population viability, and ecosystem issues related to the maintenance of biological diversity, especially in fragmented landscapes.

Prerequisite: Enrollment is restricted to environmental studies graduate students.

ENVS 230 - Agroecology and Sustainable Agriculture (5)

The application of ecological concepts and principles to the design and management of agricultural systems. The long-term goal of sustainable agroecosystems is examined in economic, social, and ecological contexts.

Prerequisite: Enrollment is restricted to environmental studies graduate students.

ENVS 235 - Social Theories of Nature (5)

Intensive reading and discussion seminar on the treatment of nature in social theory. Focuses on major recent works which examine nature in social theory, in themselves, and in the context of the intellectual history of development of disciplinary discourses about nature. Students write critical reviews of assigned books and a research paper situating a particular book within its intellectual tradition. Prerequisite(s): interview with instructor to determine preparedness.

ENVS 240 - Public Policy and Conservation (5)

Introduction to political and economic approaches to policy analysis, with particular reference to natural resource scarcity, property rights, and environmental conservation. Case studies apply economic and policy process concepts to the management of public lands, biodiversity, and renewable resources.

Prerequisite: Enrollment is restricted to environmental studies graduate students.

ENVS 247 - Regional Approaches to Environmental Policy (5)

A research seminar combining theoretical issues in democratic theory, political economy, and planning with emerging concepts of bioregionalism. The focus is on institutional, scientific, and political innovations in managing the environment. Students evaluate current and historical proposals to regionalize environmental policy in the U.S.

Prerequisite: Enrollment is restricted to environmental studies graduate students.

ENVS 250 - Coastal Governance (5)

Introduction to major theories of ocean and coastal governance, with emphasis on those that underlie current policy and management approaches. Students analyze local, state, national, and international laws and policies, considering interactions across scales, levels of social organization, and institutions.

Prerequisite: Enrollment is restricted to environmental studies graduate students.

ENVS 263 - Plant Disease Ecology (5)

Introduction to ecological roles of plant diseases, including their importance in regulating plant populations dynamics, community diversity and system function in natural ecosystems, considerations of plant diseases in conservation ecology, and ecological approaches to managing diseases in agroecosystems. Students cannot receive credit for this course and ENVS 163.

Prerequisite: Prerequisite(s): one ecology course. Enrollment is restricted to graduate students.

ENVS 265 - Data Science for the Environment (5)

Data science is growing exponentially in size and quality, changing environmental scholarship and creating challenges of sifting, processing, and synthesizing large and diverse sources of information. In this course, students learn the fundamental practices of environmental informatics mainly using the R programming language. The workshop-style course is designed without requirement on prior experience in R. Includes environmental-related modules such as climate change, plant growth, animal predator-prey dynamics, overfishing and marine protected areas. Throughout the quarter, students use new hands-on skills to find an environmental-related topic, write a proposal, search for data, perform analyses, summarize results, and complete a final paper.

Prerequisite: Enrollment is restricted to graduate students.

ENVS 268 - Biogeochemistry and the Global Environment (5)

Studies biogeochemical cycles and related environmental issues such as global environmental change, eutrophication, ecosystem degradation, and agricultural sustainability. Discusses transformation and movement of major nutrient elements in context of watershed ecology and societal implications. Students cannot receive credit for this course and ENVS 168.

Prerequisite: Enrollment is restricted to environmental studies graduate students.

ENVS 271 - Valuing the Environment (5)

Intensive seminar examining the normative underpinnings of environmental values. Draws on tools from analytical, ethical, and political philosophy to develop normative arguments concerning environmental inequality and justice, environmental preservation, and risk evaluation. Involves team projects in which students develop cases on controversial contemporary issues such as biotechnology. Prerequisite(s): interview only. Enrollment restricted to graduate students.

ENVS 272 - Qualitative Field Methods (5)

Introduces qualitative research approaches in environmental studies. Focuses on philosophies of science, epistemological debates, and specific approaches to qualitative methods. Course components include: field safety, research ethics, human subjects, training, research design and sampling, field observation and ethnographies, key informants, field notes, focus groups, oral histories, narrative research, archival research, questionnaires, discourse analysis, participatory research, and qualitative data analysis techniques.

Prerequisite: Enrollment is restricted to graduate students.

ENVS 280 - Advanced Topics in Environmental Studies (5)

Intensive research seminar, including reading and critique of primary research literature and research in progress. Topics vary and are announced in advance; students should consult with faculty prior to enrolling. Enrollment by permission of instructor. Enrollment restricted to graduate students.

ENVS 283 - Environmental Studies Internship (5)

Graduate level internship focuses on integrating interdisciplinary academic theory with practical, specialized experience in a professional setting. Course intended for environmental studies graduate students; students must complete paperwork and meet with coordinator prior to first day of instruction.

ENVS 290 - Interdisciplinary Research Seminar (2)

Research seminars presented weekly throughout the year by environmental studies and affiliated faculty, by visiting scholars, and by graduate students. Students discuss the content and methodology of research presented following each seminar.

Prerequisite: Enrollment is restricted to graduate students.

ENVS 290L - Graduate Research Seminar (2)

Graduate student presentations of doctoral research proposals, dissertation work-in-progress, grant applications, and conference papers. This weekly laboratory meeting seeks to develop professional skills, teach constructive criticism, and foster effective discussion among peers.

Prerequisite: Enrollment is restricted to graduate students.

ENVS 291 - Advanced Readings in Environmental Studies (3)

Focusing on a recently published volume or on a topic of current interest, this seminar requires a rigorous analysis of the principles and methods employed in the four core areas of the program: sustainable agriculture and agro-ecology; conservation biology; environmental policy analysis; and political economy.

Prerequisite: Enrollment is restricted to graduate students.

ENVS 291C - Advanced Readings in Risk and Public Policy (3)

Advanced readings and research on environmental risk and public policy. Explores environmental decision making given the question of the burden of proof and scientific uncertainty

and grapples, in an advanced manner, with emergent policy alternatives, such as the precautionary principle. Also offered as ENVS 281C for 5 credits.

Prerequisite: Prerequisite(s): ENVS 172 or equivalent work demonstrated by an interview. Enrollment is restricted to graduate students.

ENVS 291D - Advanced Readings in Tropical Ecology, Agriculture, and Development (3)

Analyzes recent publications in ecology, conservation, agroecology, and development in tropical and subtropical regions, particularly Latin America. Discussions place special emphasis on integration across natural and social science disciplines to address issues of sustainability in tropical regions.

Prerequisite: Enrollment is restricted to graduate students.

ENVS 291M - Advanced Readings in Biogeochemistry (3)

Course consists of three parts: fundamental biogeochemistry of the Earth, global cycles of nutrient elements, and societal and scientific issues of global change. Class activities include (1) presentation of summary statements based on reading assignments; (2) discussion of theories, concepts, methodologies, and applications; (3) computer simulation and modeling of elemental cycles using STELLA; and (4) integration of scientific information on global change with social issues by writing.

Prerequisite: Enrollment is restricted to graduate students.

ENVS 291P - Advanced Readings in Environmental History and Anthropology (3)

Course of readings systematically surveying the theoretical contributions of the disciplines of environmental history, historical ecology, environmental anthropology, and geography. After an overview of the evolution of 20th-century thought on the relationship between environment and culture as seen through the lenses of these disciplines, explores emerging research hybrids and new research frontiers.

Prerequisite: Enrollment is restricted to graduate students.

ENVS 292 - Topics in Research in Environmental Studies (2)

Seminar in which students give critically evaluated presentations regarding current research in environmental studies and issues in research design. Students should consult with faculty prior to enrolling.

Prerequisite: Enrollment is restricted to graduate students.

ENVS 297A - Independent Study (5)

Independent study and research under faculty supervision. Students submit petition to sponsoring agency.

ENVS 297B - Independent Study (10)

Independent study and research under faculty supervision. Students submit petition to sponsoring agency.

ENVS 297C - Independent Study (15)

Independent study and research under faculty supervision. Students submit petition to sponsoring agency.

ENVS 297F - Independent Study (2)

Independent study and research under faculty supervision. Intended to be taken in conjunction with a 5-credit course. Students submit petition to sponsoring agency.

ENVS 299A - Thesis Research (5)

Students submit petition to sponsoring agency.

ENVS 299B - Thesis Research (10)

Students submit petition to sponsoring agency.

ENVS 299C - Thesis Research (15)

Students submit petition to sponsoring agency.

ESCI - ENVIRONMENTAL SCIENCES

Lower-Division

ESCI 30 - Biological Principles of Environmental Sciences (5)

Introduction to biology and ecology for environmental sciences, focusing on the role of biological organisms within the Earth system. Topics span molecular/organismal interactions, such as photosynthesis and respiration, to global biogeochemical cycles including the role of microbes, net community production, and contaminant distributions.

Upper-Division

ESCI 100A - Introduction to Environmental Sciences (5)

Introduces fundamental concepts for quantitative analysis of environmental problems and their application to complex systems focusing on algebraic tools. Key concepts include box models, mass and energy balances (including chemical processes), turning word problems into mathematical statements, and estimation. (Formerly Earth Sciences 114A.)

Prerequisite: Prerequisite(s): MATH 11A or MATH 19A, CHEM 1A, and PHYS 6A or PHYS 5A. Enrollment is restricted to environmental sciences majors.

ESCI 100B - Introduction to Environmental Processes (5)

Quantitative exploration of physical and chemical processes relevant to the environment and their applications to complex environmental systems. Focuses on calculus-based tools. Key concepts include fluid mechanics, heat transfer, mass transfer, particle mechanics, turbulence, and physicochemical processes. (Formerly Earth Sciences 114B.)

Prerequisite: Prerequisite(s): ESCI 100A or EART 114A, MATH 11B or MATH 19B, CHEM 1C, and PHYS 6B or PHYS 5B. Enrollment is restricted to environmental sciences and Earth sciences majors.

ESCI 122 - Air Pollution (5)

Introduces students to the chemistry and physics of air pollution with primary emphasis on understanding the main types of air pollutants, from where they originate, how they are removed, how to control their sources, measurement techniques, and their health effects.

Prerequisite: Prerequisite(s): ESCI 100A or EART 110A.

ESCI 160 - Data Analysis in the Environmental Sciences (5)

Introduces data-analysis methods regularly encountered within environmental sciences. Students learn how to think about data, its uncertainty, how models and data are related and depend on underlying assumptions, and how to synthesize information contained in data.

Prerequisite: Prerequisite(s): MATH 11B or MATH 19B or equivalent. Enrollment is restricted to environmental sciences majors.

ESCI 167 - Applied Environmental Time Series Analysis (5)

Explores empirical approach to quantify and explain changes in the Earth system over time. With the complexity of the Earth system, and the challenge of making accurate and numerous observations, simple methods can be of limited usefulness. Course covers more advanced methods that are typically not included in introductory-level statistical courses. Students learn how to analyze time-series data and answer questions about the Earth system and acquire the theoretical basis of the statistical approaches, the experience at conducting analyses, and practice interpreting and discussing the results. This class is hands-on and utilizes a suite of observational datasets and outputs from Earth system models. Students cannot receive credit for this course and OCEA 267.

Prerequisite: Prerequisite(s): ESCI 160.

ESCI 191 - Capstone Seminar (5)

In-depth exploration of a topic within the environmental sciences. Involves at least one research paper. Topics vary quarterly; consult the current course listings. Prerequisite(s): Entry Level Writing and Composition requirements; ESCI 100A and previous or concurrent enrollment in ESCI 100B. Enrollment is restricted to environmental sciences majors. Enrollment is by application with selection based on appropriate background and academic performance and by consent of the instructor. Satisfies the senior comprehensive requirement.

ESCI 195 - Senior Thesis (5)

Students complete their senior thesis research projects and submit their thesis in the form of a research paper that is appropriate for submission to a relevant journal or conference. Prerequisite(s): Entry Level Writing and Composition requirement. Enrollment is restricted to environmental sciences majors. Satisfies the senior comprehensive requirement. Students submit petition to sponsoring agency.

FILM - FILM AND DIGITAL MEDIA**Lower-Division****FILM 10 - Professional Topics in Film, Television, and Digital Media (2)**

Taught by a working professional, lectures and workshop provide students with career-related information and insight into a specific profession in film, television, and digital media. Students research various aspects of a film, television, or digital media profession.

Prerequisite: Enrollment is restricted to proposed and declared film and digital media majors and minors.

FILM 20A - Introduction to Film Studies (5)

An introduction to the basic elements, range, and diversity of cinematic representation and expression. Aesthetic, theoretical, and critical issues are explored in the context of class screenings and critical readings. If space allows, restrictions may be lifted after priority enrollment.

Prerequisite: Enrollment is restricted to proposed and declared film and digital media majors and film and digital media minors. Students pursuing the minor may contact the instructor for a permission code.

FILM 20B - Introduction to Television Studies (5)

Introduction to the basic forms of televisual presentation, including differing narrative structure from movies and situation comedies to soap opera, plus modes of direct discourse in news, advertising, sports, music, television, and other genres. Alternative forms and modes in electronic media, such as independent video art and documentary, public television, cable, and electronic networks are explored, with their potential for expressing cultural diversity set in relation to social, cultural, and political conditions. If space allows, restrictions may be lifted after priority enrollment.

Prerequisite: Enrollment is restricted to proposed and declared film and digital media majors and film and digital media minors. Students pursuing the minor may contact the instructor for a permission code.

FILM 20C - Introduction to Digital Media (5)

Introduces fundamental features of digital media and examines the immense visual, social, and psychological impact of the digital revolution on our culture. Topics include the concepts and forms of the digital hypertext interface, Internet, and web, and the impact of digital media on conceptions of the self, body, identity, and community. If space allows, restrictions may be lifted after priority enrollment.

Prerequisite: Enrollment is restricted to first-year, sophomore, and junior declared, proposed, and pre-film and digital media majors and film and digital media minors. Students pursuing the minor may contact the instructor for a permission code.

FILM 20P - Introduction to Production Technique (5)

Introduction to the production processes of visual/aural, time-based, creative work. Students work on a range of creative projects: performed, written, photographed, and created digitally. Assignments emphasize imaginative problem-solving, collaboration, visualization, and critical media literacy.

Prerequisite: Enrollment is restricted to proposed and declared film and digital media majors.

FILM 80A - The Film Experience (5)

Students learn to understand how films reach the public through a collaborative, industrial, and artistic practice; how films work in a narrative sense; how they construct meanings for viewers; and how their formal techniques construct different possibilities for meaning and interpretation.

FILM 80M - Understanding Media (5)

Introduces students to contemporary concerns, issues, and topics of media and media criticism. With an emphasis on visual analysis, students develop conceptual tools to think critically about photography, cinema, television, video, and print journalism.

FILM 80S - Special Topics in Film and Digital Media (5)

Study of selected aspects of film, television, and/or digital media. Includes weekly screenings and historical/theoretical readings.

FILM 80T - Technothrillers (5)

Examination of recent films classified as thrillers that approach technology (computers, robotics, biotech, the Internet, etc.) through suspense, anxiety, and paranoia. It will also address how technologically produced popular culture negotiates attitudes toward technological change.

FILM 80V - Video Games as Visual Culture (5)

Through aesthetic, medium-specific and critical theories of electronic games, course introduces histories, ideas, and debates that inform critical game studies. Themes include: games and cinema; race, class, gender, sexuality and representation; visual/cultural studies approaches; topical issues in games.

FILM 80X - Sex in the Cinema (5)

Examines the historical representation of sexual difference, orientation, and politics in film and video using cultural studies, political and economic historiography, and feminist and queer theory and paying special attention to intersections of U.S. political movements with filmmaking and reception.

Upper-Division**FILM 120 - Introduction to Media Theory (5)**

Explores media theory. May be organized thematically or chronologically. Selects from key debates and movements central to understanding media forms in relation to self, society, politics, and aesthetics.

Prerequisite: Prerequisite(s): FILM 20A. Enrollment is restricted to proposed and declared film and digital media majors.

FILM 130 - Silent Cinema (5)

Presents the development of silent film as a cultural form from the early period to the beginning of sound, addressing its historical evolution, technological development, aesthetic transformations, and varied cultural contexts. Usually offered in alternate academic years.

Prerequisite: Prerequisite(s): FILM 20A, satisfaction of the Entry Level Writing and Composition requirements.

FILM 132A - International Cinema to 1960 (5)

A survey of significant developments in narrative film outside Hollywood from the advent of sound technology to the late '50s. Differing inter/national contexts, theoretical movements, technological innovations, and major directors are studied. Usually offered alternate academic years.

Prerequisite: Prerequisite(s): FILM 20A, satisfaction of the Entry Level Writing and Composition requirements.

FILM 132B - International Cinema, 1960 to Present (5)

A survey of significant developments in narrative film outside Hollywood from 1960 to the present. Major film movements and directors from around the world are studied. Usually offered in alternate academic years.

Prerequisite: Prerequisite(s): FILM 20A, satisfaction of the Entry Level Writing and Composition requirements.

FILM 134A - American Film, 1930-1960 (5)

A survey of American narrative cinema from 1930 to 1960. Examines developments in film style, film technology, and the film industry in relation to American cultural history.

Prerequisite: Prerequisite(s): FILM 20A or FILM 20B, satisfaction of the Entry Level Writing and Composition requirements.

FILM 134B - American Film, 1960-Present (5)

A survey of American narrative cinema from 1960 to the present. Examines developments in film style, film technology, and the film industry in relation to American cultural history.

Prerequisite: Prerequisite(s): FILM 20A or FILM 20B; and satisfaction of the Entry Level Writing and Composition requirements.

FILM 136A - Experimental Film and Video (5)

A survey of various experimental styles and practices in film and video, addressing the historical developments of these media formats. The course situates experimental film and video work within the larger contexts of artistic traditions as well as networks of production and reception.

Prerequisite: Prerequisite(s): FILM 20A .

FILM 136B - History of Television (5)

Survey of the historical development of broadcast television from its origins to the present day phenomena of cable, satellite, and electronic networks. Examination of major genres, forms, and modes of production and consumption within cultural, social, and economic contexts. Offered every other year, alternating with FILM 136A.

Prerequisite: Prerequisite(s): FILM 20B.

FILM 136C - Visual Culture and Technology: History of New Media (5)

Explores the relationship between technology and change and surveys the history of various technologies of visual culture from print to computer based imagery and the Internet.

Prerequisite: Prerequisite(s): FILM 20C.

FILM 136D - Documentary Film and Video (5)

Explores the category of nonfiction through a historical and theoretical study of documentary in film and video. Addresses ethnographic film, Soviet and Griersonian documentary, cinema verite and/or other selected documentary texts and the issues of representation they raise. Students are billed a course materials fee.

Prerequisite: Prerequisite(s): FILM 20A or FILM 20B.

FILM 145 - Social Media Documentary Theory and Production (5)

Teaches social media documentary theory and production. Students review current scholarship around social media campaigns, cellphone footage as evidence, and the creation of original media to expand messages for social justice. Students shoot a body of source footage on their smart device and create a social media-based outreach strategy that could support future work for a grassroots initiative.

Prerequisite: Prerequisite(s): FILM 20P.

FILM 150 - Screenwriting (5)

Problems in writing for film and television are explored through the writing of original material and analysis of existing works. Various film genres, conventions, and styles, both fictional and nonfictional, are examined. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Admission by application; application materials available during the last three weeks of preceding quarter.

FILM 151 - Film Directing (5)

Workshop that explores the director's involvement in film and video production. Topics will include the manipulation of time and space, continuity, script planning and blocking, and working with actors and crew. Students will participate in group and individual exercises in pre-production and scene direction. Prerequisite(s): FILM 20A, FILM 20P, and/or FILM 170B are recommended. Admission by application; application materials available during the last three weeks of preceding quarter.

FILM 152 - Script Analysis (5)

Students analyze diverse narrative techniques, dramatic structures, and genre forms to understand the craft of screenwriting and prepare for their own creative writing and filmmaking. Students read finished scripts and view films.

Prerequisite: Prerequisite(s): FILM 120. Enrollment is restricted to proposed and declared film and digital media majors.

FILM 160 - Film Genres (5)

Concentrated study of films from one cinematic grouping with similar themes and narrative structures such as westerns, musicals, or science fiction, or a comparative study of different genres. History, theory, and criticism of the genre are covered.

Prerequisite: Prerequisite(s): FILM 130, FILM 132A, FILM 132B, FILM 132C, FILM 134A or FILM 134B.

FILM 161B - Documentary Animation (5)

Examines the history, practice, and emergence of documentary animation in contemporary film, on the Web and as activist media with emphasis on the discourse central to social documentary, decolonial theory, and the politics of representation.

Prerequisite: Prerequisite(s): FILM 20A. Enrollment is restricted to juniors and seniors.

FILM 162 - Film Authors (5)

Intensive critical study of the work of one film auteur (director, screenwriter, actor, cinematographer). Themes, style, and structure are explored using various critical modes of analysis.

Prerequisite: Prerequisite(s): FILM 130, FILM 132A, FILM 132B, FILM 134A, or FILM 134B.

FILM 165A - Film, Video, and Gender (5)

A study of texts, theories, and issues of gender in film and/or video. Changing focus on one or more topics, including production and authorship, representation, reception, theories of identification, sexual preference, and related issues. Usually offered in alternate academic years.

Prerequisite: Prerequisite(s): FILM 20A or FILM 20B.

FILM 165B - Race on Screen (5)

Review of historical and critical tools to interpret representations of race on cinematic, television, and computer screens. Class will consider the place of race in theoretical and historical scholarship and examine the debates about race produced within and across film and digital media. Usually offered in alternate academic years.

Prerequisite: Prerequisite(s): FILM 20A or FILM 20B.

FILM 165C - Lesbian, Gay, and Queer Film and Video (5)

An overview of homosexuality and LGBT representations in American film. Explores the format and historical significance of New Queer Cinema. Recent independent queer film and video discussed. Topics include: authorship; spectatorship;

genre and genre reappropriation; historical gender constructs; the art film; mainstream versus independent production; and the relationship of film to popular music.

Prerequisite: Enrollment is restricted to juniors, sophomores, and seniors.

FILM 165D - Asian Americans and Media (5)

Examines media representations about, as well as by, Asian Americans. Using critical essays on film theory, racial studies, feminist criticism, and independent cinema, students develop the skills necessary to conduct critical analysis of Asian Americans in film and television.

Prerequisite: Prerequisite(s): FILM 20A. Enrollment is restricted to sophomores, juniors, and seniors.

FILM 165E - Chicana/o Cinema, Video (5)

Examines emergence of Chicana/o cinema and video from a place of social displacement, resistance, and affirmation. Looks at Chicana/o representation and spectatorship as it pertains to ethnicity, class, gender, and the beginning of a new Chicana/o film aesthetic.

Prerequisite: Prerequisite(s): FILM 20A. Enrollment is restricted to sophomores, juniors, and seniors.

FILM 165G - Gender and Global Cinema (5)

Offers students historical and critical tools to investigate global film through the framework of gender. Focused in particular on contemporary film (from 1960 to present), the class is structured both chronologically and via national industries.

Prerequisite: Prerequisite(s): FILM 20A.

FILM 168 - National Cinema and Culture (5)

Study of a specific cinematic or other media tradition of a region, nation, language, diasporic collectivity or other unifying cultural entity. Not a survey, this course selects one focus or offers a comparative of cross-cultural framework.

Prerequisite: Prerequisite(s): FILM 130, FILM 132A, FILM 132B, or FILM 132C.

FILM 168M - National Cinema and Culture: Morocco (5)

Faculty-led study abroad course taught in Rabat, Morocco. In-depth investigation of Moroccan cinema and culture, including literature and art. Includes visits and field trips around Morocco.

FILM 170A - Fundamentals of Digital Media Production (5)

Introduction to the conceptual and technical fundamentals of making digital media. Covers principles of digital image manipulation, basic web authoring, and interface design through projects that introduce production techniques and methods.

Prerequisite: Prerequisite(s): FILM 20C or CSE 101 or CSE 111.

FILM 170B - Fundamentals of Film and Video Production (5)

An introduction to the art and craft of making films and videos. Covers principles of cinematography, videography, editing, production planning, and lighting involving both production techniques and methods. Students are billed a course materials fee. Prerequisite(s): FILM 20A or FILM 20B and at least one upper-division film and digital media critical studies course. Admission by application; application materials available during the last three weeks of preceding quarter.

FILM 171A - Sound (5)

The cinematic equation equals images plus sound. What are sound-specific properties? What is the relationship between sound and image? Course examines these and other questions through the creation of audio and audiovisual pieces. Students are billed a course materials fee. Prerequisite(s): FILM 170A or FILM 170B. Admission by application; application materials available during the last three weeks of preceding quarter.

FILM 171C - Special Topics Workshop: Found Footage (5)

Students consider the practice of transforming or recycling found images and other visual materials to create new meanings. In addition to assigned readings, screenings, and technical workshops, students produce creative found moving image projects and writing responding to course materials. Prerequisite(s): FILM 20A; priority given to students with digital editing experience. Enrollment is by instructor permission and application; application materials available during the last three weeks of preceding quarter.

FILM 171D - Social Information Spaces (5)

Investigates how information spaces can be designed to be inhabited, socially navigable spaces. Emphasizes the social navigation of information spaces, a set of techniques and ideas from computer-supported cooperative works, human-computer interaction, and architecture.

Prerequisite: Prerequisite(s): FILM 170A.

FILM 171F - Special Topics Workshop: Autobiographical Film (5)

Students explore autobiography as a filmmaking genre and practice, using experimental, fictionalized, documentary, and hybrid forms. Readings and screenings provide a theoretical context for production work. Topics include: strategies of (self) representation, reenactment, performance, portraiture, memoir, confession, and diaristic film. Students are billed a course materials fee. Prerequisite(s): FILM 170B. Admission by application; application materials available during the last three weeks of preceding quarter.

FILM 171S - Special Topics in Film and Digital Media Production (5)

Intermediate workshop-style production course which addresses diverse themes and approaches. Content changes quarterly according to faculty research interests and changing technologies/discourses in digital audiovisual production. Prerequisite(s): FILM 170B. Admission is by application;

application materials are available during the last three weeks of the preceding quarter. Students are billed a materials fee.

FILM 172 - Narrative Video Workshop (5)

Intermediate workshop in film and video production concentrating on narrative production, development of critical standards, and technical methods. Topics include cinematography, sound, and non-linear digital editing techniques. Each student is responsible for the completion of short narratives from assignments. Students are billed a course materials fee. Prerequisite(s): FILM 170B. Admission by application; application materials available during the last three weeks of preceding quarter.

FILM 173 - Narrative Digital Media Workshop (5)

Analysis of cinematic codes and narrative structure through digital video, Internet and interactive multimedia projects. Required readings address contemporary research in narratology and hyper-media, exploring the potential of digital technology to reconfigure the role of both author and audience. Students billed a course materials fee.

Prerequisite: Prerequisite(s): FILM 170A.

FILM 175 - Documentary Video Workshop (5)

Workshop in documentary video production, development of critical standards, ethical issues, and technical methods. Each student is responsible for the completion of short documentaries from assignments. Students are billed a course materials fee. Prerequisite(s): FILM 170B. Admission by application; application materials available during the last three weeks of preceding quarter.

FILM 176 - Experimental Video Workshop (5)

Introductory workshop in video production (non-narrative, experimental). Topics include a survey of non-narrative experimental video from a historical/theoretical perspective and an introduction to videography, fundamentals of video editing, and sound. Students are billed a course materials fee. Prerequisite(s): FILM 170B. Admission by application; application materials available during the last three weeks of preceding quarter.

FILM 177 - Digital Media Workshop: Computer as Medium (5)

Introduction to the computer as a medium as well as a tool. Students explore art practice within digital imaging and information and communications environments through projects, readings, and screenings. Assignments may include designing virtual communities and /or interactive, multimedia web works.

Prerequisite: Prerequisite(s): FILM 170A.

FILM 178A - Personal Computers in Film and Video (5)

Introduction to the specific applications of computers for film and video. By using computer-generated, enhanced and imported graphics, animation, text, sound, and moving video, students create still and time-based works in a computer environment. Students are billed a course materials fee.

Prerequisite(s): FILM 170A or FILM 170B. Admission by application; application materials available during the last three weeks of preceding quarter.

FILM 178B - Advanced Personal Computers in Film and Video (5)

Study of advanced computer tools in digital media, including exploration, creation, and manipulation of sound with the same level of complexity as required in composing the moving image. Students produce a final project that demonstrates skills learned. Prerequisite(s): FILM 170A or FILM 170B. Admission by application; application materials available during the last three weeks of preceding quarter.

FILM 179A - Special Topics in Animation (5)

Provides opportunities to learn technical skills in animation while engaging in critical analysis of animation and design. Students are encouraged to pursue their personal artistic vision as well as to develop a collaborative and problem-solving mindset. Prerequisite(s): FILM 170A or FILM 170B.; Admission by application; application materials available during the last three weeks of the preceding quarter.

FILM 179B - Documentary Animation Workshop (5)

A project-based production seminar in documentary animation: students learn diverse animation styles and techniques, and apply them to a documentary-animation class project. FILM 161B and FILM 170A are strongly recommended as preparation (or equivalent background). Admission by application; application materials available during the last three weeks of the preceding quarter.

FILM 180 - Writing About Film, Television, and Digital Media (5)

Improves students' ability to write and edit, and invites students to explore different kinds of writing related to film, television, and digital media including historical, theoretical, cultural criticism, popular reviews, grant proposals, online forums, and publishing.

Prerequisite: Prerequisite(s): FILM 20A, FILM 20B, or FILM 20C. Enrollment is restricted to sophomore and junior film and digital media majors.

FILM 185D - Sound and Image in Theory and Criticism (5)

Explores theories and critiques of sound in culture and analyzes sound in relation to media images in film, video, and other media. Voice, noise, and music are addressed.

Prerequisite: Prerequisite(s): FILM 120.

FILM 185R - The Film Remake (5)

History and theory of the remake through case studies across cultural, gender, and genre boundaries. Examines changing cultural, social, stylistic, and technical values and explores notions of originality, repetition, homage, allusion, quotation, and intertextuality from Feuillade and Hitchcock to Raimi and Johnny To.

Prerequisite: Prerequisite(s): FILM 120, FILM 130, FILM 132A, FILM 132B, FILM 132C, FILM 134A or FILM 134B.

FILM 185S - Advanced Topics in Film Studies (5)

Study of a selected aspect of film history, theory, or criticism. Includes weekly screenings and historical/theoretical readings. Usually offered in alternate academic years with rotating topics.

Prerequisite: Prerequisite(s): FILM 120, FILM 130, FILM 132A, FILM 132B, FILM 132C, FILM 134A, or FILM 134B.

FILM 185X - EyeCandy Seminar (5)

Seminar and workshop on writing, producing, and publishing a journal. Students engage in assignments and exercises directly and indirectly related to the production of a web launch as well as a print copy of EyeCandy. Permission of instructor required based upon student's participation in EyeCandy in winter and spring quarters. Preference given to film and digital media majors and minors; others may apply based on qualifications and as space allows.

FILM 187 - Advanced Topics in Television Studies (5)

Study of a selected aspect of television history, television criticism, or national television. Includes weekly screenings and historical/theoretical readings. Usually offered in alternate academic years, with rotating topics.

Prerequisite: Prerequisite(s): FILM 20B. Enrollment is restricted to junior and senior film and digital media majors and minors.

FILM 189 - Advanced Topics in Digital and Electronic Media Studies (5)

Study of a selected aspect of digital and/or electronic media history and criticism. Topics can include virtual environments, electronic networks, video installations, computer games, and hyper-media. Usually offered in alternate academic years.

Prerequisite: Prerequisite(s): FILM 20C. Enrollment is restricted to junior and senior film and digital media majors and minors during priority enrollment; may be opened if space allows.

FILM 192 - Directed Student Teaching (5)

Teaching a lower-division course under faculty supervision (see FILM 42). Proposal supported by a faculty sponsor and department.

FILM 194A - Film Theory Seminar (5)

Advanced senior seminar examining classical and contemporary film theory and those theoretical paradigms and methods that have illuminated the medium: formalism, realism, structuralism, semiology, psychoanalysis, Marxism, feminism, and phenomenology. Primary texts are read.

Prerequisite: Prerequisite(s): FILM 120. Enrollment is restricted to senior film and digital media majors.

FILM 194B - Electronic Media Theory Seminar (5)

Study of the major theoretical approaches to electronic media and their critical application to texts from television, independent video art and documentary, and electronic networks. Readings include a range of theoretical approaches selected from semiotic, ideological, feminist, cultural studies, reception theory, postmodernist, and other critical traditions.

Prerequisite: Prerequisite(s): FILM 120. Enrollment is restricted to senior film and digital media majors.

FILM 194C - New Media Theory Seminar (5)

Study of theories of emerging genres of electronic culture, with emphasis on the discourse about computer-assisted and computer-generated forms of art and mass culture such as digital imagery, virtual environments, telematics, hyper- and multimedia, and electronic networks

Prerequisite: Prerequisite(s): FILM 120. Enrollment is restricted to senior film and digital media majors.

FILM 194D - Film History Seminar (5)

In-depth study of film history investigating developments in cinematic style, technological innovation, and industrial practice against the broad canvas of cultural history. Students will acquire the basic tools necessary to conduct informed film historical research.

Prerequisite: Prerequisite(s): FILM 120; and FILM 130 or FILM 134A or FILM 134B. Enrollment restricted to senior film and digital media majors.

FILM 194E - International Cinemas (5)

In-depth study of the history and theory of international cinemas with changing topics such as globalism and resistance, postcolonial theory, international productions and querying race, the national, and cinema.

Prerequisite: Prerequisite(s): FILM 120; and FILM 132A or FILM 132B or FILM 132C. Enrollment restricted to senior film and digital media majors.

FILM 194F - Film and the Other Arts (5)

Examines the use of artistic media within films and of films that thematically are about other media. What do other art forms allow for in terms of the story, the film's meaning, the gaze, and the spectator?

Prerequisite: Prerequisite(s): FILM 120. Enrollment restricted to senior film and digital media majors.

FILM 194G - New(s) Media (5)

Addresses the role of new media technologies in the production, distribution, and reception of the news, especially international news. Examines software and network technologies as amplifying, filtering, extending, and countering the forces of media.

Prerequisite: Prerequisite(s): FILM 120. Enrollment restricted to senior film and digital media majors.

FILM 194H - Ethics and Documentary Filmmaking (5)

Online senior seminar that addresses long-standing ethical dilemmas including filmmaker/participant relationships, ethical ethnographic filmmaking, and conversations regarding the role of social media and new media. Explores issues such as allyship, privilege, and insider/outsider responsibilities for filmmakers working with topics such as class, the environment, gender, feminism, race and sexuality.

Prerequisite: Prerequisite(s): FILM 120 and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior film and digital media majors.

FILM 194S - Special Topics Seminar (5)

Intensive research and writing on a changing topic chosen to demonstrate critical mastery in a specific area of film and digital media studies, for example, film adaptations and their literary sources, documentary/reality shows, or networked new media texts.

Prerequisite: Prerequisite(s): FILM 120. Enrollment restricted to senior film and digital media majors.

FILM 195 - Senior Thesis/Project (5)

An individually supervised course, with emphasis on independent research, to culminate in a senior thesis/project/production. Proposals should be submitted to adviser one quarter in advance. Petition required, approved by instructor and department; thesis petitions available in the department office.

FILM 196A - Senior Project in Narrative Production (5)

Students accomplish a range of production work focused on narrative production including script development, casting, and rehearsing to shooting and post-production work. Students are billed a course materials fee. Admission by application; application materials available during the last three weeks of preceding quarter. Students may apply a maximum of two times. Enrollment restricted to senior film and digital media majors.

FILM 196B - Senior Project in Screenwriting (5)

Students write a full-length (75-100 pages) screenplay in this seminar while studying structural concepts and character development in selected films. Scheduling, outlining, pitching ideas, and critique are all part of the workshop format of the class. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; FILM 150 or another screenwriting course. Admission by application; application materials available during the last three weeks of the preceding quarter. Enrollment is restricted to senior film and digital media majors.

FILM 196C - Senior Documentary Workshop (5)

Students are responsible for producing short documentaries (up to 12 minutes). In class, students discuss each other's work as well as view and discuss other documentary films. Students are billed a course materials fee. Admission by application; application materials available during the last three weeks of the

preceding quarter. Enrollment restricted to senior film and digital media majors.

FILM 197 - Senior Digital Media Workshop (5)

Incorporates independent projects using the computer as a medium as well as a tool. Students design and implement projects in digital imaging, information, and communications environments. Students' projects may include designing virtual communities, building collaborative networks, and/or interactive, multimedia web works. Admission by application; application materials available during the last three weeks of the preceding quarter. Enrollment is restricted to senior film and digital media majors.

FILM 198 - Independent Field Study (5)

Provides for department-sponsored individual study programs off campus for which faculty supervision is not in person (e.g., supervision is by correspondence). Students engaging in field study must complete application procedures for such study by the fifth week of the previous quarter. Field study may not be used to satisfy major requirements. Petition required, approved by instructor and department; petitions available in the department office.

FILM 198F - Independent Field Study (2)

Provides for department-sponsored individual study programs off campus for which faculty supervision is not in person (e.g., supervision is by correspondence). Students engaging in field study must complete application procedures for such study by the fifth week of the previous quarter. Field study may not be used to satisfy major requirements. Petition required, approved by instructor and department; petitions available in the department office.

FILM 199 - Tutorial (5)

Individual study in areas approved by sponsoring instructors. Tutorial may not be used to satisfy major requirements. Petition required, approved by instructor and department; petitions available in the department office.

FILM 199F - Tutorial (2)

Individual study in areas approved by sponsoring instructors. Tutorial may not be used to satisfy major requirements. Petition required, approved by instructor and department; petitions available in the department office.

Graduate**FILM 200A - Introduction to Graduate Study (5)**

Introduces graduate study in the critical practice of film and digital media. Conducted as a pro-seminar, with faculty presentations and discussion.

Prerequisite: Enrollment restricted to graduate students.

FILM 200B - Theory and Praxis of Film and Digital Media 1 (5)

Investigates methods for rhetorical production of written and visual/aural texts. Emphasizes questions about delineation between theory and practice, and provides groundwork in

theories relevant to key areas in film, television, and digital media studies.

Prerequisite: Enrollment restricted to graduate students.

FILM 200C - Theory and Praxis of Film and Digital Media 2 (5)

Investigates methods for rhetorical production of written and visual/aural texts. Emphasizes interwoven practices of the artist/researcher/teacher, formal and expressive possibilities of hybridized research, and cultural issues raised by integrated methods of inquiry.

Prerequisite: Enrollment restricted to graduate students.

FILM 202 - Pedagogy in Film and Digital Media (2)

Prepares students for teaching assistantships and instructor roles. Topics include TAs, designing inclusive course syllabi and lesson plans, active learning, teaching technologies, and classroom environment.

Prerequisite: Enrollment is restricted to graduate students.

FILM 203 - Professional Development in Film and Digital Media (3)

Prepares graduate students with professional skills in the discipline, such as CV writing, grants research and writing, public presentation, exhibition, publication, and job seeking.

Prerequisite: Enrollment is restricted to graduate students.

FILM 222 - Critical Methodologies in Film and Television (5)

Introduces graduate students to critical methodologies in media studies and offers sustained examination of theoretical approaches to media studies. Methodologies may include (but are not limited to) contemporary theory (semiotic, psychoanalytic, ideological), cultural studies, intertextuality, feminist film, and television theory.

Prerequisite: Enrollment restricted to graduate students.

FILM 223 - The Film/Video Essay (5)

Focuses on essayistic approaches to scholarship and production, emphasizing relationships between theory and praxis that this mode of production requires.

Prerequisite: Enrollment restricted to graduate students.

FILM 224 - Mediating Difference (5)

Considers theoretical and strategic, situated difference in the era of (semi-)colonialism, post-colonialism, and globalism, examining theoretical writing alongside media works on the topic.

Prerequisite: Enrollment restricted to graduate students.

FILM 225 - Software Studies (5)

Today, our lives are woven into vast software systems that facilitate our family communications, personal relations, jobs, and cultural, economic, political, and social institutions. Course examines these conditions of life and thought using insights from the arts and humanities.

Prerequisite: Enrollment restricted to graduate students.

FILM 226 - Queer Theory and Global Film and Media (5)

Examines queer subjectivities, practices, and theories in relation to globalization, transnationalism, and postcoloniality, focusing on film/media produced outside the United States. The course addresses representation and also uses queer theoretical work to engage wider contexts of film/media production, distribution, and exhibition.

Prerequisite: Enrollment restricted to graduate students.

FILM 227 - Representing Memory (5)

Studio-based hybrid practice/theory to explore problems of historical representation in film, video, and new media and engage with the production of new cinematic/visual forms that take on issues of personal, collective, and national memories.

Prerequisite: Enrollment is restricted to graduate students.

FILM 228 - Moving Image Archives and the Frontiers of Information (5)

Explores moving image archives in relation to social movements, technological change, and moving image use and reuse. Theories of memory, information, and technology provide a framework for discussions, site visits, and individual projects.

Prerequisite: Enrollment restricted to graduate students.

FILM 229 - Topics in Documentary Studies (5)

Examines the forms, discourses, and practices of documentary film, television, video, and other media in relation to cultural, social, and political history and theory. While the thematic focus varies from term to term, each edition of the course places critical thought and documentary work in conversation around issues central to forms of social knowledge and action.

Prerequisite: Enrollment restricted to graduate students.

FILM 230 - Expanded Documentary (5)

Students explore the aesthetic, political, and ethical dimension of new and expanded forms of documentary practice including: new media; database-driven, interactive documentary; participatory media; social media; and documentation-based art practices.

Prerequisite: Enrollment restricted to graduate students.

FILM 231 - Topics in Postcolonial Theories, Film, and Media (5)

Explores topics in postcolonial theories and film and media around themes such as colonialism, modernity, and institutions of cinema; colonial histories and national or transnational film and media; race, gender, sexuality and colonialism; the uneven implications, pitfalls, and possibilities of the term postcolonial in relation to film and media.

Prerequisite: Enrollment restricted to graduate students.

FILM 232 - Audiovisual Ethnography (5)

Students learn the technical and critical skills required for fieldwork-based ethnographic video and audio media production. The course is structured around cumulatively building filmmaking skills with an emphasis on critically informed nonfiction ethnographic observation.

Prerequisite: Enrollment restricted to film and digital media, anthropology, or social documentation graduate students.

FILM 234 - Toward an Ethics of New Media (5)

Investigates an ethics of new media. Using an intersectional approach, students read thematic units that consider issues of race, class, and gender as they crosscut questions of advanced technological tools and their implementation in modern society.

Prerequisite: Enrollment restricted to graduate students.

FILM 235 - Feminist Media Histories (5)

Investigates feminist histories of film, radio, television, video, technology, playable media, and digital culture from the 19th century through the present day. Students learn varied historiographic methodologies and also engage in primary historical research.

Prerequisite: Enrollment restricted to graduate students.

FILM 236 - Making...in the Anthropocene (5)

Through readings and assignments, students explore the notions of making and the temporal context of the Anthropocene. Making is broadly defined as any creative production. The Anthropocene and climate change are studied as urgent and compelling context.

Prerequisite: Enrollment is restricted to graduate students.

FILM 237 - Graduate Critique (5)

Develops fluency in the languages of critical practice as expressed across media. Integrates critical and analytical writing about objects and experiences created by and through electronic and digital media with ongoing, student-driven critiques of audiovisual scholarship.

Prerequisite: Enrollment is restricted to film and digital media graduate students. Graduate students from other programs may enroll by permission of the instructor.

FILM 238 - The Politics of Information (5)

Explores the production and perception of information (news, stories, figures, identities, controversies, and complacencies). Students research, analyze, theorize, and define the scope of the politics of information, study the consequences of media(ted) knowledge, and propose possibilities for critical intervention and change.

Prerequisite: Enrollment is restricted to graduate students.

FILM 239 - Topics in Media Theory (5)

Explores advanced media theory and the methodologies of media analysis. Themes and issues to be drawn from media

history; material, popular, or mass cultures; network and information theory; and intellectual, institutional, political, or cultural contexts.

Prerequisite: Enrollment is restricted to graduate students.

FILM 283 - New Media Art and Digital Culture (5)

A study of new media art in the context of digital culture. Electronic, digital and online technology art are set in critical relation to discourse on history, aesthetics, hypermedia, the interface, hacks, embodiment, robotics, artificial life and other topics.

Prerequisite: Enrollment restricted to graduate students.

FILM 284 - Film, Culture, and Modernity (5)

Traces the rise of motion picture culture from the late 19th century through the end of the 1920s, looking at film's emerging visual and narrative grammar, its changing cultural status, and its engagement with shifting registers of class, ethnicity, gender, and sexuality.

Prerequisite: Enrollment restricted to graduate students.

FILM 295 - Directed Reading (5)

Directed reading that does not involve a term paper. Students submit petition to course-sponsoring agency. Enrollment restricted to graduate students.

FILM 297 - Independent Study (5)

Either study related to a course being taken or a totally independent study. Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit.

FILM 297F - Independent Study (2)

Students submit petition to course-sponsoring agency. Enrollment restricted to graduate students.

FILM 299A - Thesis Research (5)

Students submit petition to course sponsoring agency. Enrollment restricted to graduate students.

FILM 299B - Thesis Research (10)

Students submit petition to course sponsoring agency. Enrollment restricted to graduate students.

FMST - FEMINIST STUDIES**Lower-Division****FMST 1 - Feminist Studies: An Introduction (5)**

Introduces the core concepts underlying the interdisciplinary field-formation of feminist studies within multiple geopolitical contexts. Explores how feminist inquiry rethinks disciplinary assumptions and categories, and animates our engagement with culture, history, and society. Topics include: the social construction of gender; the gendered division of labor,

production, and reproduction; intersections of gender, race, class, and ethnicity; and histories of sexuality.

FMST 10 - Feminisms of/and the Global South (5)

Explores feminist theories from domestic U.S. and global contexts in order to ask how interventions of women of color in the U.S. and of radical feminist movements in non-U.S. locations radically re-imagine feminist politics. Rather than focusing on feminist movements that represent different regions of the world, course examines feminist theory through multiple histories of colonialism, post-colonialism, and globalization.

FMST 12 - Podcasting: Feminist Files (5)

Introduces students to the basics of podcasting and guides students to become contributors to Feminist Files, a podcast that makes feminist scholarship and scholars accessible to the public. This course gives students the theoretical and practical framework to critique a variety of podcasts and engage in the podcast movement. Students learn how to conceptualize stories, research topics, interview guests, write scripts, host shows, records and edit audio. Students also build their collaboration skills by working in groups to produce segments.

Prerequisite: Prerequisite(s): Completion of at least one other lower-division feminist studies course.

FMST 13 - California Indian History (5)

California encompasses the nation's largest Native population and the state's policies create a complex political and legal structure. This course provides a history of early California in the 18th and 19th centuries and a review of the urban Indian experience in the 20th century. The first part sets the historical foundation and traces early California Indian history. The second part shifts to 20th-century urban Indian issues and the contemporary moment for California Indian peoples. Covers topics such as Indian labor exploitation, genocide, termination, relocation, and federal recognition.

FMST 14 - Popular Culture in South Asia (5)

Popular culture enables people to make sense of their modern selves and their place in the world. Focusing on South Asia, this course explores the region's rich and variegated popular culture forms, including film, music, television, the painted and printed image, and sport. It also investigates how the popular articulates with nation and global conjunctures and how it constructs hierarchies of class, gender, caste, and sexuality.

FMST 15 - Gender, Sexuality, and Transnational Migration Across the Americas (5)

Examines migration as a mode of inquiry into transnational practices across geographic locales and temporal zones. Analyzes migration in relation to the transnational formation of gender, race, and sexuality as well as processes of neocolonialism, the state, and globalization. Taught in conjunction with FMST 115.

FMST 16 - Media Histories--News and New Media (5)

The news is a set of narratives that produce, maintain, repair, and transform reality. Using three events that brought together

old and new media, this course traces how the interaction of new media with news has changed how we make sense of the world around us and our place in it.

FMST 18 - Black Feminist Ethnographies (5)

Black feminist theoretical and methodological approaches to the dailiness of women's lives, which considers historical and contemporary Black feminist interventions and praxis that challenge ethnographic hegemony. Students revisit old and new debates to ponder questions of authority, genres, positionality, and citation politics.

FMST 19 - Black Feminisms: An Introduction (5)

Focuses on key issues, core concepts and debates foundational to Black feminisms. With some consideration from the Black diaspora, students examine processes of self-making from resistance to a history of violence, practices and strategies of creative survivalism, and the ongoing struggle to liberation.

FMST 20 - Feminism and Social Justice (5)

Examines, and critically analyzes, select post-World War II movements for social justice in the United States from feminist perspectives. Considers how those movements and their participants responded to issues of race, class, gender, and sexuality. A feminist, transnational, analytic framework is also developed to consider how those movements may have embraced, enhanced, or debilitated feminist formations in other parts of the world.

FMST 21 - Religion in American Politics and Culture (5)

Introduces dominant discourses about Christianity and Islam in the American public sphere, with particular attention paid to race, gender, sexuality, and class in thinking about religion. Visual and textual media, political commentary, and popular ethnographies are analyzed.

FMST 30 - Feminism and Science (5)

Explores questions of science and justice. Examines the nature of scientific practice, the culture of science, and the possibilities for the responsible practice of science. Rather than focusing on feminist critiques of science, the course examines how science and technology are changing our world and the workings of power.

FMST 31 - Disability Studies (5)

Introduces students to the key critical concepts, debates, and questions of practice in the emerging field of disability studies, with a focus on feminist and critical race approaches to disability.

FMST 40 - Sexuality and Globalization (5)

Examines the relationship between sexuality and the contemporary term globalization as a dense entanglement of processes that emerges from a history of U.S. empire. Sexuality cannot be separated from power struggles over the classification of bodies, territories, and questions of temporality. Examines how sexualized contact zones produce new knowledge, commerce, inequalities, possibilities, and identities.

FMST 41 - Trans Gender Bodies (5)

Draws from representations of transgender/transsexual people in popular, biomedical, and political contexts. Examines the impact of transgender lives on concepts of gender, identity, and technology. Engages with biological and sexological frameworks of sex/gender, trans experience, and social movements and theories.

Upper-Division**FMST 100 - Feminist Theories (5)**

Core course for feminist studies. Serves as an introduction to thinking theoretically about issues of feminism within multiple contexts and intellectual traditions. Sustained discussion of gender and its critical connections to productions of race, class, and sexuality. Focus will change each year.

Prerequisite: Enrollment is restricted to sophomores, juniors, and seniors.

FMST 102 - Feminist Critical Race Studies (5)

Working from the perspective that race is a cultural invention and racism is a political, economic, and social relation, investigates how race is produced as a meaningful and powerful social category, examines the effects of racism as a social relation, and argues for the necessity of combining feminist and critical race studies. By considering different historical periods and places, aims to equip students with the tools necessary to critically examine the production and reproduction of race and racism in the U.S.

Prerequisite: Prerequisite(s): one course from feminist studies. Enrollment is restricted to juniors and seniors.

FMST 105 - Feminist Methodologies (5)

Recommended for transfer students. Focuses on particular debates about feminist methodology. Specific methodological debates vary each year but might include feminist theorizing of experience, epistemology, situated knowledges, notions of truth and the real. Feminist methods may include transnational approaches, as well as queer, decolonial, postcolonial, and critical race methodologies. Enrollment is by permission of the instructor. (Formerly FMST 75.)

FMST 112 - Women and the Law (5)

Interdisciplinary approach to study of law in its relation to category women and production of gender. Considers various materials including critical race theory, domestic case law and international instruments, representations of law, and writings by and on behalf of women living under different forms of legal control. Examines how law structures rights, offers protections, produces hierarchies, and sexualizes power relations in both public and intimate life.

Prerequisite: Enrollment is restricted to feminist studies, politics, legal studies, and Latin American and Latino studies/politics combined majors during first and second pass enrollment.

FMST 115 - Gender, Sexuality, and Transnational Migration**Across the Americas (5)**

Examines migration as a mode of inquiry into transnational practices across geographic locales and temporal zones. Analyzes migration in relation to the transnational formation of gender, race, and sexuality as well as processes of neocolonialism, the state, and globalization.

Prerequisite: Prerequisite(s): FMST 1, FMST 100, or FMST 145. Enrollment is restricted to sophomores, juniors, and seniors.

FMST 117 - Post Zora Interventions: Art, Activism and Anthropology (5)

This experimental course situates the pioneer and controversial ethnographer, novelist, and playwright Zora Neale Hurston as an avant-garde. Analyzing her influence on academics, activists and artists, students consider the complex ways anthropology functions as material (from the textual to the visual), a source of both inspiration and refusal. In the process of exploration, students critically ponder what constitutes an intervention in academia, on the streets, or in artistic settings?

FMST 119 - Indigenous Feminisms (5)

Explores issues central to Indigenous women's life experiences and Native feminist thought. Students consider the concerns and methodologies of Native feminisms—theories and actions that highlight how settler colonialism is a fundamentally gendered process. Engages in foundational discussions of Native feminisms, settler colonial theory, and feminist methodologies. Course content focuses on communities in settler states currently known as the U.S. and Canada. Covers topics such as reproductive justice, gendered violence, cultural reclamation, and rematriation.

FMST 120 - Transnational Feminisms (5)

Explores the emergence of transnational feminism through U.S. women of color and postcolonial feminism. Underscores the role of globalization, nationalism, and state formation in relation to feminist theorizing, activism, and labor across the Global South. In an attempt to understand the salience of inequalities, the course interrogates the continuation of feminist critique that is attentive to the war on terror, neocolonialism, and empire.

Prerequisite: Prerequisite(s): FMST 1. Enrollment is restricted to sophomores, juniors, and seniors.

FMST 123 - Feminism and Cultural Production (5)

Explores relationship between feminism and culture. Topics will vary and include different forms of cultural production such as film and literature. Regional/national focus will also vary.

Prerequisite: Prerequisite(s): FMST 1. Enrollment is restricted to sophomores, juniors, and seniors.

FMST 124 - Technology, Science, and Race Across the Americas

(5)

Examines new ways of understanding the body and race through the intersection of technology and science. Addresses how broader structures of power and the rise of new technological and scientific discoveries mediate power relations and alter how race, national boundaries, the body, and citizenship are normalized and contested from colonialism to the present. Course content may vary; themes may include: U.S. eugenics, I.Q. tests, patenting debates, sterilization, assisted reproduction, biometrics, and genetics across the Americas.

Prerequisite: Enrollment is restricted to sophomore, junior, and senior feminist studies majors.

FMST 125 - Race, Sex, and Technology (5)

Explores theories and case studies tied to race, gender, and technology. Covers the history of feminist and critical race analyses of technology as well as contemporary debates.

FMST 126 - Images, Power, and Politics: Methods in Visual and Textual Analysis (5)

Introduces the analysis of visual images and text with particular emphasis on feminist critical methodologies. Using case studies from photography, film, TV, advertising, and new media, students learn how to read and analyze culture.

Prerequisite: Enrollment is restricted to sophomore, junior, and senior feminist studies majors.

FMST 131 - The Politics of Matter and the Matter of Politics (5)

Considers how things--what we may think of as objects, matter, nature, technology, bodies--are constitutive elements of social and political life. What happens to the political as a category if we take this matter seriously?

Prerequisite: Prerequisite(s): FMST 1.

FMST 132 - Gender and Postcoloniality (5)

Postcolonial feminist studies. Explores how discourses of gender and sexuality shaped the policies and ideologies of the historical processes of colonialism, the civilizing mission, and anticolonial nationalism. Considers orientalism as a gendered discourse as well as colonial understandings of gender and sexuality in decolonialization. Explores Western media representations, literature, the law, and the place of gender in the current debate between cultural relativism and universalism. Provides an understanding of some key terms in postcolonial studies and an in-depth examination of the place of gender in these processes.

Prerequisite: Enrollment is restricted to juniors and seniors.

FMST 133 - Science and the Body (5)

Contemporary technoscientific practices, such as nano-, info-, and biotechnologies, are rapidly reworking what it means to be human. Course examines how both our understanding of the human and the very nature of the human are constituted through technoscientific practices.

Prerequisite: Prerequisite(s): FMST 1 and FMST 100.

Enrollment is restricted to juniors and seniors.

FMST 135 - Topics in Science and Sexuality (5)

Introduces the multiple debates animating the linkages between science, race, and sexuality. Interrogates the interrelated, epistemological frameworks of science and sexuality/queer studies across a range of interdisciplinary and geopolitical locations.

Prerequisite: Prerequisite(s): FMST 100 or FMST 145.

Enrollment is restricted to sophomores, juniors, and seniors.

FMST 136 - Organizing for Water Justice in California (5)

Investigates, imagines, and practices movement toward water justice in California using feminist, Indigenous, and critical race theory. The course includes collaborative projects with environmental justice organizers in the Central Valley, and offers new ways of thinking about water inequity and access through racial capitalism, settler colonialism, and critical theories of place.

FMST 139 - African American Women's History (5)

Considers African American women as central to understanding of U.S. history, focusing on everyday survival, resistance, and movements for social change. Discussion of critical theories for historical research, gender, and race. Emphasis on biography, cultural history, and documentary and archival research.

Prerequisite: Enrollment is restricted to sophomores, juniors, and seniors.

FMST 145 - Racial and Gender Formations in the U.S (5)

Introduces the defining issues surrounding racial and gender formations in the U.S. through an understanding of the term women of color as an emergent, dynamic, and socio-political phenomenon. Interrogates organizing practices around women of color across multiple sites: film and media, globalization, representation, sexuality, historiography, and war, to name a select few.

FMST 150 - Mediating Desire (5)

From a foundation in semiotics, considers the ways race and gender are constructed, understood, performed, embraced, commodified, and exploited through representations. Uses representations of, by, and for the margins to engage theories of communication, identity, and representation. Creative final projects encouraged.

Prerequisite: Enrollment is restricted to sophomore, junior, and senior feminist studies majors or by permission of instructor.

FMST 175 - Gender and Sexualities in Latina/o America (5)

Advanced topics in gender and sexuality in Latin America and Latina/o studies. Analyzes role of power, race, coloniality, national and transnational processes in the production and analysis of genders and sexualities. Materials include memoir, fiction, ethnography, social documentary and history.

Prerequisite: Enrollment is restricted to sophomore, junior, and senior feminist studies majors or by permission of instructor.

FMST 188 - Topics in Feminist Studies (5)

Focuses on a particular topic in feminist theory. Topics vary each offering but might include theorizing the gendered subject, racializing gender, politics and feminism, the relationship between queer theory and feminism, transgender studies, women of color feminisms, postcolonial and decolonial feminisms, feminist science studies.

Prerequisite: Enrollment is restricted to sophomores, juniors, and seniors.

FMST 189 - Advanced Topics in Feminist Theory (5)

Focus on a particular problem in feminist theory. Problems vary each year but might include theorizing the gendered subject, racializing gender, the meeting points of psychoanalysis and social-political analysis in theorizing gender, the relationship between queer theory and feminist theory, postcolonial feminist theory.

Prerequisite: Prerequisite(s): FMST 100. Enrollment is restricted to juniors, seniors, and graduate students.

FMST 193 - Field Study (5)

Individual field study in the vicinity of the campus under the direct supervision of a faculty sponsor. Students submit petition to sponsoring agency.

FMST 193F - Field Study (2)

Individual field study in the vicinity of the campus under the direct supervision of a faculty sponsor. Students submit petition to sponsoring agency.

FMST 194A - Feminist Jurisprudence (5)

Approaches legal reasoning from a feminist and intersectional perspective with attention to structures and jurisdiction, case materials, and emerging international frameworks for gender justice. Designed to facilitate completion of a substantial research essay based in feminist legal philosophy.

Prerequisite: Prerequisite(s): FMST 1 and FMST 100; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior feminist studies majors.

FMST 194B - Queer/Feminist Historiography (5)

Providing for a critical examination of canonical formations in history and archives, this course proposes new ways of thinking about history from the point of view of those who have been marginalized or excluded by race, class, gender, or sexuality.

Prerequisite: Prerequisite(s): FMST 1 and FMST 100; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior feminist studies majors.

FMST 194C - Gender and Iconicity (5)

Examines icons and the processes through which an iconicity is constructed and circulated in its complexity. Icons and iconicities often link or articulate various ideologies, affects, and systems of thought into a potent symbol or a mythology. Icons constitute norms, but also disrupt them; icons could articulate new technologies, aesthetics and their representations of the self with purportedly older modes of being in the world, such as a transcendent belief in a god, a faith, etc.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, and FMST 1 and FMST 100. Enrollment restricted to senior feminist studies majors.

FMST 194D - Feminist Science Studies (5)

Examines different feminist approaches to understanding the nature of scientific practices. Particular attention paid to notions of evidence, methods, cultural and material constraints, and the heterogeneous nature of laboratory practices. Considers the ways in which gender, race, and sexuality are constructed by science and how they influence both scientific practices and conceptions of science. Also examines the feminist commitment to taking social factors into account without forfeiting the notion of objectivity.

Prerequisite: Prerequisite(s): FMST 1 and FMST 100; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior feminist studies majors.

FMST 194F - Chicana/Latina Cultural Production (5)

Traces the intersection between Chicana studies and Latin American studies through transnational forms of cultural production, imaginaries, and empowerment. Analysis of theories of cultural production and discussion of the political salience of culture as a site for resistance, critique, and creativity.

Prerequisite: Prerequisite(s): FMST 1 and FMST 100; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior feminist studies majors.

FMST 194G - Images of Africa (5)

Explores questions of colonialism, empire, race, gender, and geopolitics in the proliferating images--filmic, televisual, and media--of Africa in the United States. Facilitates the completion of a substantial research essay based on the study of popular culture.

Prerequisite: Prerequisite(s): FMST 1 and FMST 100; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior feminist studies majors.

FMST 194H - Michel Foucault: An Introduction (5)

French philosopher Michel Foucault's writings on modern forms of knowledge, power, and subjectivity provide a serious challenge to how we negotiate social oppression. Engages some

of Foucault's most cited works, and grapples specifically with his primary claim that modern societies are marked less by freedom and autonomy than by discipline and docility.

Prerequisite: Prerequisite(s): FMST 1 and FMST 100; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior feminist studies majors.

FMST 194I - Feminist Oral History and Memoir (5)

Designed to train students in oral history and memoir writing. Emphasizes the specialness of transgressive voices; race, class, and sexuality, women's silence, erasure, censorship, and marginalization are addressed. The politics of memory, narratives, storytelling, and editorial judgment are considered.

Prerequisite: Prerequisite(s): FMST 1 and FMST 100; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior feminist studies majors.

FMST 194K - Black Diaspora (5)

Seminar focuses on the historical and subjective processes that produce the concept of an African or Black Diaspora. In narrative, film, and cultural studies, themes of slavery, exile, home, identity, alienation, colonialism, politics, and reinvention are explored.

Prerequisite: Prerequisite(s): FMST 1 and FMST 100; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior feminist studies majors.

FMST 194L - Comparative Settler Colonial Studies (5)

Discusses the characteristics of settler colonialism and the politics of comparison in the study of global settler colonialism. Looks at settler colonial state practice across multiple different sites, including Santa Cruz, as students craft their own research projects. (Formerly offered as Decoloniality, Feminism, and Science Studies.)

Prerequisite: Prerequisite(s): FMST 1 and FMST 100; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior feminist studies majors. Crosslisted as: Prerequisite(s): CRES 10 and CRES 100; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior critical race and ethnic studies majors.

FMST 194M - Empire and Sexuality (5)

Explores the production of sexualities, sexual identification, and gender differentiation within multiple contexts of colonialism, decolonization, and emerging neo-colonial global formations.

Prerequisite: Prerequisite(s): FMST 1 and FMST 100; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior feminist studies majors. Crosslisted as: Prerequisite(s): CRES 10 and CRES 100; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior critical race and ethnic studies majors.

FMST 194O - The Politics of Gender and Human Rights (5)

Examines human rights projects and discourses with a focus on the politics of gender, sexuality, race, and rights in the international sphere. Reading important human rights documents and theoretical writings, and addressing particular case studies, emphasizes the tensions between the ideals of the universal and the particular inherent in human rights law, activism, and humanitarianism.

Prerequisite: Prerequisite(s): FMST 1 and FMST 100; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior feminist studies majors. Crosslisted as: Prerequisite(s): CRES 10, CRES 100; satisfaction of the Entry Level Writing and Composition requirements.

FMST 194Q - Queer Diasporas (5)

Queer diaspora emerged from Third World/queer-of-color critique of queer theory and provides a framework for analyzing racializations, genders, and sexualities in colonial, developmental, and modernizing contexts. Readings from anthropology, history, literature, and feminist and cultural studies.

Prerequisite: Prerequisite(s): FMST 1 and FMST 100; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior feminist studies majors. Crosslisted as: Prerequisite(s): CRES 10 and CRES 100. Enrollment restricted to critical race and ethnic studies majors.

FMST 194T - Transgender Studies (5)

Explores literature from the natural sciences, anthropology, history, cultural studies, and sociology. Provides theoretical approaches to complex questions in queer studies and geopolitics, and a framework for understanding embodiment, medical regulation, gender formation, the human/animal divide, etc.

Prerequisite: Prerequisite(s): FMST 1 and FMST 100; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior feminist studies majors.

FMST 194U - Touring War and Empire (5)

Senior seminar focusing on tourism, colonialism, and militarism. Considers case studies on tourism in colonial contexts and sites of U.S. empire across multiple geographies as students craft their projects, participate in writing workshops, and present research.

Prerequisite: Prerequisite(s): FMST 1 and FMST 100; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior feminist studies majors.

FMST 194V - Marxism and Feminism (5)

Explores critically the intersections and crisis points between feminism and Marxism as bodies of thought, theoretical formations, and forms of historical inquiry.

Prerequisite: Prerequisite(s): FMST 1 and FMST 100; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior feminist studies majors.

FMST 194W - Politics of Space, Time, and Matter (5)

Senior seminar focusing on questions of the politics of space, time, and matter. Readings informed by fields, such as indigenous studies, queer studies, afrofuturism, borderland studies, critical race studies, decolonial studies, disability studies, feminist science studies, and new materialisms.

Prerequisite: Prerequisite(s): FMST 1 and FMST 100; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior feminist studies majors.

FMST 195 - Senior Thesis or Project (5)

The senior thesis/project which satisfies the major requirement. Course is for independent research and writing. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; students submit petition to sponsoring agency.

FMST 198 - Independent Field Study (5)

Provides for individual study program off campus for which faculty supervision is not in person. Students submit petition to sponsoring agency.

FMST 198F - Independent Field Study (2)

Provides for individual study program off campus for which faculty supervision is not in person. Students submit petition to sponsoring agency.

FMST 199 - Tutorial (5)

Individual directed study for upper-division undergraduates. Students submit petition to sponsoring agency.

FMST 199F - Tutorial (2)

Individual directed study for upper-division undergraduates. Students submit petition to sponsoring agency.

Graduate

FMST 200 - Feminist Theories (5)

Introductory required course for feminist studies graduate students. Covers major theorists, debates, and current questions as well as foundational texts through which feminist critiques have been grounded. Content changes with instructor.

Prerequisite: Enrollment is restricted to graduate students.

FMST 201 - Topics in Feminist Methodologies (5)

Explores feminist theorizing across disciplinary and cultural contexts for both methodology (theories about the research process) and epistemology (theories of knowledge). Goal is to orient students toward changes in organization of knowledge and provide them with different feminist methodologies in their pursuit of both an object of study and an epistemology.

Prerequisite: Enrollment is restricted to graduate students.

FMST 202 - Disciplining Knowledge/Graduate Research (5)

Prepares students to develop research skills and initiate their research projects. Students consider what is meant by feminist research and undertake designing and performing feminist research.

Prerequisite: Prerequisite(s): FMST 200 and FMST 201. Enrollment is restricted to graduate students.

FMST 203 - Feminist Pedagogies (5)

Examines feminist pedagogies as projects in transgressing traditional disciplinary boundaries. Examines historical examples of alternative pedagogies and contemporary models for creating communities dedicated to social justice. Designed to assist graduate students develop teaching strategies in multiple fields.

Prerequisite: Enrollment is restricted to graduate students.

FMST 207 - Topics in Queer/Race Studies (5)

Explores the interrelated epistemological frameworks of critical race studies and queer studies. Through the study of a range of philosophical, scientific, literary, and cinematic texts, course historicizes and theorizes discourses of race and sexuality.

Prerequisite: Enrollment is restricted to graduate students.

FMST 208 - African(a) Genders and Sexualities (5)

Examines a number of classic and new critical texts in the field of African(a) Feminism and Sexuality. Focuses on how African(a) scholars have had to theorize genders and sexualities through an intersectional lens that takes into account questions of decoloniality and freedom. How might we rethink issues of oppression and domination in relationship to race, nation, sex, gender, and sexuality in the global Black world using the tools provided by Africa(a) scholars?

Prerequisite: Enrollment is restricted to graduate students.

FMST 209 - Comparative Empires: Gender, Slavery, Race (5)

Explores the interrelated, epistemological frameworks of race, slavery and gender across multiple Oceanic and imperial networks. Histories of empire and slavery have been overdeterminedly tethered to singular histories of nation-states, temporalities and/or geopolitics. Bypassing the idea of slavery and/or empire as a stable or temporal concept, students are guided instead by an interdisciplinary and comparative framework, seeking more the robust vernaculars and geo-histories that found our current understandings of race, gender and sexuality.

Prerequisite: Enrollment is restricted to graduate students.

FMST 211 - Sexuality, Race, and Migration in the Americas (5)

Analyzes the ways transnational processes intersect with changing notions of gender, sexuality, and race. Examines processes such as tourism, the Internet, capitalism, and labor

spanning Brazil, the Dominican Republic, and the United States.

Prerequisite: Enrollment is restricted to graduate students.

FMST 212 - Feminist Theory and the Law (5)

Interrogation of the relationship between law and its instantiating gendered categories, supported by feminist, queer, Marxist, critical race, and postcolonial theories. Topics include hypostasization of legal categories, the contest between domestic and international human rights frameworks, overlapping civil and communal codes, cultural explanations in the law, the law as text and archive, testimony and legal subjectivity.

Prerequisite: Enrollment is restricted to graduate students.

FMST 214 - Topics in Feminist Science Studies (5)

Graduate seminar on feminist science studies. Topics will vary and may include: the joint consideration of science studies and poststructuralist theory; the relationship between discursive practices and material phenomena; and the relationship between ontology, epistemology, and ethics.

Prerequisite: Enrollment is restricted to graduate students.

FMST 215 - Postcolonial and Postsocialist Transactional Analytics (5)

Addresses the intersection of the postcolonial and the postsocialist as theoretical ground. Considers how (neo)liberal ideologies about race, class, gender, secularism, and democracy are shaped by the intersection between postsocialist geopolitics and imperial legacies. (Formerly Postsocialism, Postcolonialism, Neoliberalism.)

Prerequisite: Enrollment is restricted to graduate students.

FMST 216 - Archives/Genders/Histories: An Introduction (5)

Explores the entanglements of archives, genders, and histories across a number of intellectual and imperial contexts. Approaches the concept of the archive to reflect on who counts as a historical and/or gendered subject and what are the ethics of representation that guide such archival formations. Draws on literature from philosophy, gender/sexuality studies, anthropology, history, and literary criticism.

Prerequisite: Enrollment is restricted to graduate students.

FMST 218 - Militarism and Tourism (5)

Positioning tourism and militarism as central sites of inquiry for feminist and ethnic studies, course draws from literature on colonialism and empire to illuminate how tourism functions and how tourists move, in sites of past and present warfare.

FMST 222 - Religion, Feminism, and Sexual Politics (5)

Focuses on the increasing importance of religion as a category of analysis in feminist theory. Addresses the relationship of religion, feminist politics, and activism in connection with nationalism, the family, sexuality, and geopolitics.

Prerequisite: Enrollment is restricted to graduate students.

FMST 232 - Topics in Postcolonial Studies (5)

Variable topics that could include postcolonial approaches to questions of epistemology and knowledge production, theories of nationalism and nation-state formation, subaltern historiography, analyses of modernization and developmental theory, postcolonial approaches to globalization, and transnationalism. Significant component of feminist contributions to these literatures.

Prerequisite: Enrollment is restricted to graduate students.

FMST 243 - Feminism, Race, and the Politics of Knowledge (5)

Course takes as its central topic the institutional politics of feminist and critical race knowledges in the post-1960s United States university. Considers these fields' complex and contradictory relation to disciplinarity, the university's primary or default mode of arranging and legitimizing knowledge formations.

Prerequisite: Enrollment is restricted to graduate students.

FMST 260 - Black Feminist Reconstruction (5)

Re-visions and extends Reconstruction from 1865-1920 from a black feminist standpoint. Topics include: redefining democracy; labor; literacy and education; suffrage; re-visioning sexuality; childbirth; parenting, etc. Analyzes traditional historiography and the methodological implications of the boundaries between history and fiction, and archival and oral traditions.

Prerequisite: Enrollment is restricted to graduate students.

FMST 270 - Anthropology at Its Interfaces with Feminist, Postcolonial, and Decolonial STS (5)

Focuses on generative interfaces within and at the edge of the anthropological discipline, in particular, the way ethnographies and fields are being reconfigured by feminist, postcolonial, and decolonial perspectives and methodologies in science and technology studies (STS).

Prerequisite: Enrollment is restricted to graduate students.

FMST 290 - Pedagogical Training (2)

First-year graduate students meet with the teaching assistant trainer for bi-weekly meetings covering pedagogical approaches. Also includes class visits and shadowing. Enrollment is restricted to graduate students. (Formerly offered as First-Year Advising.)

FMST 291 - Advising (2)

Independent study formalizing the advisee-adviser relationship. Regular meetings to plan, assess, and monitor academic progress, and to evaluate coursework as necessary. May be used to develop general bibliography of background reading trajectory of study in preparation for the qualifying examination. Enrollment restricted to graduate students.

FMST 297A - Independent Study (5)

Independent study and research under faculty supervision. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

FMST 297B - Independent Study (10)

Independent study and research under faculty supervision. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

FMST 297F - Independent Study (2)

Independent study and research under faculty supervision. Students submit petition to sponsoring agency. Enrollment is restricted to graduate students.

FMST 299A - Thesis Research (5)

Prerequisite(s): advancement to candidacy. Enrollment restricted to graduate students.

FMST 299B - Thesis Research (10)

Prerequisite(s): advancement to candidacy. Enrollment restricted to graduate students.

FREN - FRENCH**Lower-Division****FREN 1 - First-Year French (5)**

Introduction to French language and culture with practice in all four language skills: listening, speaking, reading, and writing. Intended for students with no previous study of French.

FREN 2 - First-Year French (5)

Further development of cultural competence and basic French language skills, both written and spoken. Students learn past tenses in this course.

Prerequisite: Prerequisite(s): FREN 1 or placement by interview.

FREN 3 - First-Year French (5)

Final quarter of first-year sequence. Students complete study of French language basics, including the future tense and the conditional and the subjunctive moods, while continuing to learn about French and Francophone cultures.

Prerequisite: Prerequisite(s): FREN 2 or placement by interview.

FREN 4 - Second-Year French (5)

First course in intermediate sequence. Students review and expand upon their previous study of the language through short literary readings, vocabulary building, grammar study, composition, and discussions.

Prerequisite: Prerequisite(s): FREN 3 or placement by interview.

FREN 5 - Second-Year French (5)

Further development of intermediate-level oral and written skills through study of vocabulary and structures. Students also read and discuss a French or Francophone play.

Prerequisite: Prerequisite(s): FREN 4 or placement by interview.

FREN 6 - Second-Year French (5)

Final course of intermediate sequence includes grammar study, vocabulary building, extensive writing, and discussion. Reading of a French or Francophone novel is an integral part of course.

Prerequisite: Prerequisite(s): FREN 5 or placement by interview.

FREN 85 - (De)constructing contemporary French identity (5)

Taught in English, this course examines core values and events in France, such as Republican values (in the French sense of "Republican"), secularism, globalization, immigration, that have helped shape current French society.

FREN 94 - Group Tutorial (5)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Students submit petition to sponsoring agency.

FREN 99 - Tutorial (5)

Students submit petition to sponsoring agency.

FREN 99F - Tutorial (2)

Students submit petition to sponsoring agency.

Upper-Division**FREN 108 - French Cinema (5)**

Investigation of a variety of topics (historical, cultural, and linguistic) in France and the French-speaking world. Topics are explored through film. Conducted in English.

FREN 111 - Stylistics (5)

Intensive work in French composition with the aim of attaining fluency and accuracy of expression while developing literary appreciation. May be repeated for credit with consent of instructor.

Prerequisite: Prerequisite(s): FREN 6. Students interested in this course who have not taken the prerequisite should meet with the instructor prior to the first class meeting.

FREN 114 - French Phonetics (5)

Introduction to the French sound system and basic phonetics. Extensive practice of French pronunciation and phonetic transcriptions of both written and spoken language samples.

Prerequisite: Prerequisite(s): FREN 6.

FREN 120 - French Linguistics (5)

Major topics in contemporary French linguistics, covering both formal and social properties of French. Descriptive and theoretical study of phonetics and phonology, lexicon, morphology, syntax, sociolinguistic variation, status of regional and minority languages, and language planning. Taught in French.

Prerequisite: Prerequisite(s): FREN 6 or equivalent proficiency in French or by consent of the instructor.

FREN 121 - History of the French Language (5)

Overview of the history and development of the French language from Latin to early modern French. Sound changes, grammatical and lexical changes, language policy (e.g., l'Académie française), external influences on the language. Taught in French.

Prerequisite: Prerequisite(s): FREN 6 or equivalent proficiency in French, or by permission of the instructor.

FREN 125A - French Civilization: 19th Century (5)

Survey of the important historical events, social changes, and artistic movements contributing to the development of French culture during the 19th century.

Prerequisite: Prerequisite(s): FREN 6.

FREN 125B - French Civilization: 20th Century (5)

A survey of the important historical events, social changes, and artistic movements contributing to the development of French culture during the 20th century.

Prerequisite: Prerequisite(s): FREN 6.

FREN 130 - French for Professions (5)

Students better understand administrative organization in France through preparation of their own professional dossier in French, and preparation to look for professional opportunities in France. Taught in French.

Prerequisite: Prerequisite(s): FREN 6, or equivalent proficiency in French, or by permission of the instructor.

FREN 131 - Social Activism in France: The Tradition of Chanson Française Engagée (5)

Explores the French tradition of musical activism from the French Revolution to the present. Societal issues such as war, racism, poverty, environmental issues, globalization, and terrorism are addressed.

Prerequisite: FREN 6 or by interview with consent of instructor.

FREN 136 - La Francophonie (5)

In-depth multidisciplinary study of one or more French-speaking regions of the world. Topics may include history, language, society, literature, and the arts. All coursework will be done in French.

Prerequisite: Prerequisite(s): FREN 6.

FREN 194 - Group Tutorial (5)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Students submit petition to sponsoring agency.

FREN 199 - Tutorial (5)

Students submit petition to sponsoring agency.

FREN 199F - Tutorial (2)

Students submit petition to sponsoring agency.

GAME - GAMES AND PLAYABLE MEDIA**Graduate****GAME 200 - Game Design Systems (5)**

Analyzes how games aggregate mechanics to create dynamic, interactive systems. Students analyze and design systems by general categories (e.g., movement, economy, conflict) to better understand their histories, relationships, and implementations.

Prerequisite: Enrollment is restricted to graduate students.

GAME 201 - Level Design (5)

Level design integrates architecture, psychology, and drama with the tools of game making. Course explores both 2D and 3D level design through both analysis and construction of video game levels, along with key readings, particularly in architecture.

Prerequisite: Enrollment is restricted to graduate students.

GAME 202 - Foundations of Alternative Controller Games (5)

Provides an introduction to physical computing and interaction design concepts critical for building novel physical interfaces. Employs a combination of theory and practice, ranging from gamepad, circuit, and interaction design to in-class activities creating alternative controller games.

Prerequisite: Enrollment is restricted to games and playable media and serious games graduate students.

GAME 210 - Game Art Intensive (5)

Teaches the basic vocabulary, concepts, and practices of creating 2D and 3D art assets for games, as well as their management and integration into game engines. Includes sprites, models, textures, animations, and an introduction to effects.

Prerequisite: Enrollment is restricted to games and playable media and serious games graduate students; others by interview.

GAME 215 - Audio Direction (5)

Introduces fundamentals of digital audio and its implementation into a game project. Explores elements of acoustic audio therapy, musical theory, and digital audio theory, coupled with hands-on creation. Students work with audio software,

synthesis, plug-in processing and microphones to develop and create an audio direction.

Prerequisite: Enrollment is restricted to games and playable media and serious games graduate students, or by permission of the instructor.

GAME 221 - Professional Development for Game Makers (5)

Professional preparation for students in Games and Playable Media, and Serious Games master's degree programs. Includes entrepreneurship, employment rights, IP law, interview skills, business analysis, and other topics aligned with the dynamic industry of computer games.

Prerequisite: Enrollment is restricted to games and playable media and serious games graduate students; others by interview.

GAME 222 - Professional Development for Game Makers II (2)

Second course in a three-course sequence covering the game industry, game jobs, current thinking on games, and becoming a professional game maker. Focus on design considerations and methodologies employed in the game industry with emphasis placed upon the student's ability to develop designs beyond mere ideas through to execution.

Prerequisite: Enrollment is restricted to games and playable media graduate students.

GAME 223 - Professional Development for Games Makers III (2)

The third course in a three-course sequence covering the game industry, game jobs, current thinking on games, and becoming a professional game maker. Focuses on the business of the game industry, including funding, corporation types and formation, budgeting and burn rates, pitch decks, and marketing.

Prerequisite: Enrollment is restricted to games and playable media graduate students.

GAME 230 - Fundamentals of Game Engineering (5)

Deep introduction to technologies used in the construction of computer games. Principles of 2D game engine design, including architecture, object-oriented design patterns, collision detection, particle systems. Also examines artificial intelligence techniques including pathfinding, state machines, and behavior trees.

Prerequisite: Enrollment is restricted to games and playable media graduate students.

GAME 231 - Game Technologies (5)

Learn the fundamentals of at least two contemporary game engines. Develop 3D game prototypes using custom-level geometry and shaders. Understand common features of the engines and how engine-specific features shape the space games that are reasonable to implement.

Prerequisite: Prerequisite(s): GAME 230; or GAME 235 and GAME 236. Enrollment is restricted to graduate students.

GAME 232 - Advanced Game Technologies (5)

Exposes students to cutting-edge research technologies enabling the creation of games not possible with off-the-shelf techniques. Students learn how understand research to incorporate such technologies into a game. Students create rapid prototypes using several different technologies.

Prerequisite: Prerequisite(s): GAME 230; or GAME 235 and GAME 236. Enrollment is restricted graduate students.

GAME 235 - Game Development I (5)

First in a two-course sequence providing an introduction to game programming using a modern object-oriented language. Introduces the technologies used in the construction of computer games. Introduces the principles of 2D game engine design, including architecture, object-oriented design patterns, and collision detection. Students may not receive credit for this course and GAME 230.

Prerequisite: Enrollment is restricted to graduate students.

GAME 236 - Game Development II (5)

Second in a two-course sequence providing an introduction to game programming using a modern object-oriented language. Intermediate technologies are used in the construction of computer games. Includes NPC behavior, scenes and shaders, physics, debugging, and managing game code. Students may not receive credit for this course and GAME 230.

Prerequisite: Prerequisite(s): GAME 235. Enrollment is restricted to graduate students.

GAME 238 - Computer Graphics for Games (5)

Advanced computer-graphics techniques for computer games. Covers a range of computer graphics techniques used in contemporary computer games, with emphasis on those that complement existing game engines. Subjects covered include: lighting for models and scenes, shader programming (including several visual effects), procedural mesh manipulation, advanced use of particle systems, and non-photorealistic rendering techniques.

Prerequisite: Prerequisite(s): GAME 230 or GAME 235. Enrollment is restricted to graduate students.

GAME 240 - Game Usability (5)

Research approaches to game usability, from direct interaction with players to game instrumentation methods. Students learn to understand, select between, and adapt research designs and analysis approaches. Includes defining and measuring impact and effect size of serious games.

Prerequisite: Enrollment is restricted to graduate students.

GAME 250 - Foundations of Serious Games (5)

Provides an overview of the serious games field, including projects in various domains and using various design approaches. Introduces the fundamentals of requirements analysis and efficacy measurement for the serious games field, and their connections to game and project design.

Prerequisite: Enrollment is restricted to games and playable media and serious games graduate students, or by permission of the instructor.

GAME 251 - Games User Research (5)

Research approaches to user experience of games, from direct interaction with players to game instrumentation methods. Students learn to understand, select between, and adapt research designs and analysis approaches. Includes defining and measuring impact and effect size of serious games.

Prerequisite: Enrollment is restricted to Serious Games graduate students.

GAME 252 - Modeling and Simulation (5)

Introduces the concepts of models, including how models are created and represented both conceptually and computationally. Also delves into practical aspects of developing and evaluating simulations. Students introduced to the value of simulations for what-if analysis as well as a way to explore and derive models around specific phenomena such as social and cultural structures, global warming, weather systems, among other applications within the field of serious games. Students introduced to various theoretical concepts and then asked to implement a project involving developing a model and simulation given a particular topic.

Prerequisite: Enrollment is restricted to computational media graduate students.

GAME 255 - Serious Games Studio I (5)

Focuses on developing innovative project concepts, rapid prototyping and playtesting, and the creation of concept presentations. Students identify appropriate sources of subject matter expertise, elicit knowledge to inform a game project, and integrate that knowledge into the core gameplay experience.

Prerequisite: Prerequisite(s): GAME 200, or GAME 230, or GAME 236, or GAME 250. Enrollment is restricted to graduate students.

GAME 256 - Serious Games Studio II (5)

Students work in teams to develop serious games. Involves multiple aspects of game production with emphasis on initiating production and coordination between requirements and design, and preparing a game iteration for efficacy measurement. Students receive frequent critiques on emerging game projects.

Prerequisite: Prerequisite(s): GAME 255. Enrollment is restricted to graduate students.

GAME 257 - Serious Games Studio III (5)

Students work in teams to develop serious games. Involves multiple aspects of game production with emphasis on performing efficacy measurements and responding through iteration. Students receive frequent critiques on final game projects.

Prerequisite: Prerequisite(s): GAME 256. Enrollment is restricted to serious games graduate students.

GAME 270 - Games and Playable Media Studio I (5)

First course in a three-course sequence covering the fundamentals and advanced topics in game and playable-media development. Focuses on developing innovative project concepts using methods ranging from prototyping to design documents, planning, and initiating project development.

Prerequisite: Enrollment is restricted to games and playable media graduate students; others by interview.

GAME 271 - Games and Playable Media Studio II (5)

The second course in a three-course sequence in which students work in teams to develop an innovative computer game. Coursework involves multiple aspects of game production, including agile methodology; game and level design; development of code to implement game behavior; art direction; and audio design. Students receive frequent critiques on emerging game projects.

Prerequisite: Prerequisite(s): GAME 270. Enrollment is restricted to games and playable media graduate students.

GAME 272 - Games and Playable Media Studio III (5)

The third course in a four-course sequence in which students work in teams to develop an innovative computer game. Coursework involves multiple aspects of game production including agile methodology; game and level design; development of code to implement game behavior; art direction; and audio design. Students receive frequent critiques on emerging game projects.

Prerequisite: Enrollment is restricted to graduate students in the games and playable media program.

GAME 273 - Game Production Intensive (10)

Fourth course in a four-course sequence in which students work in teams to launch an innovative computer game. Coursework involves multiple aspects of game production, including agile methodology, game and level design, development of code to implement game behavior, art direction, and audio design. The emphasis is on interacting with game media to publicize the game. Students receive frequent critiques on emerging game projects.

Prerequisite: Enrollment is restricted to graduate students in the games and playable media program.

GAME 280A - Games Proseminar (2)

Students learn through guest speakers, design exercises, master classes, and interactive group activities. Students prepare through reading texts, playing games, and developing their own materials. Features visitors from small and large developers, game scholars, and those using games in general. Can be taken for Satisfactory/Unsatisfactory credit only.

Prerequisite: Enrollment is restricted to games and playable media, and serious games graduate students, or by permission of the instructor.

GAME 280Y - Games You Should Know (2)

Examines games that produce novel experiences. Each session consists of game play and discussion of associated readings. Students learn to appreciate the range of possible game experiences, and understand key design ideas that enable those experiences.

Prerequisite: Enrollment is restricted to graduate students.

GAME 290A - Advanced Topics in Games (5)

In-depth study of current topics in digital and non-digital games. Topics vary, but are expected to include virtual reality, augmented reality, novel game interfaces, advanced computer graphics techniques, advanced game-design techniques, advanced procedural content generation, and autonomous characters.

Prerequisite: Enrollment is restricted to graduate students.

GERM - GERMAN**Lower-Division****GERM 1 - First-Year German (5)**

German 1, a beginning-level course, introduces the German language and culture for students with no previous knowledge of German. The course focuses on speaking, reading, writing, and listening. The first-year sequence (GERM 1-GERM 2-GERM 3) starts in fall quarter only. (An accelerated sequence, GERM 1A-GERM 1B, begins in winter quarter.) (Formerly Instruction in the German Language.)

GERM 1A - Accelerated German (5)

Accelerated course covers GERM 1 and part of GERM 2. It is designed for motivated beginning students. Students develop skills in speaking, reading, writing, and listening to real-life German.

GERM 1B - Accelerated German (5)

Accelerated course part 2 covers part of GERM 2 and all of GERM 3. In this course, students who have successfully completed GERM 1A (or its equivalent) continue to develop competence in speaking, reading, writing, and understanding real-life German.

Prerequisite: Prerequisite(s): GERM 1A or GERM 2 or placement by examination. For students completing GERM 2, GERM 3 is preferable.

GERM 2 - First-Year German (5)

GERM 2, a second-quarter course, is designed for students who have successfully completed German 1 (or its equivalent). Students continue to develop competence in speaking, reading, writing, and understanding in the context of real-life language use.

Prerequisite: Prerequisite(s): GERM 1 or GERM 1A or placement by examination.

GERM 3 - First-Year German (5)

GERM 3 is designed for students who have successfully completed GERM 2 (or its equivalent; e.g., 2-3 years of high school German). Students continue to develop competence in speaking, reading, writing, and understanding real-life German.

Prerequisite: Prerequisite(s): GERM 2 or placement by examination.

GERM 4 - Second-Year German (5)

Intermediate composition and conversation based on the reading of selected prose and related cultural material. Speaking, reading, writing, and listening comprehension skills are developed by extensive use of media materials. Conducted entirely in German.

Prerequisite: Prerequisite(s): GERM 1B or GERM 3 or placement by examination.

GERM 5 - Second-Year German (5)

Intermediate composition and conversation based on the reading of selected prose and related cultural material. Speaking, reading, writing, and listening comprehension skills are developed by extensive use of media materials. Conducted entirely in German.

Prerequisite: Prerequisite(s): GERM 4 or placement by examination.

GERM 6 - Second-Year German (5)

Intermediate composition and conversation based on the reading of selected prose and related cultural material. Speaking, reading, writing, and listening comprehension skills are developed by extensive use of media materials. Conducted entirely in German.

Prerequisite: Prerequisite(s): GERM 5 or placement by examination.

GERM 94 - Group Tutorial (5)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Students submit petition to sponsoring agency.

GERM 99 - Tutorial (5)

Students submit petition to sponsoring agency.

GERM 99F - Tutorial (2)

Students submit petition to sponsoring agency.

Upper-Division**GERM 119 - German Media (5)**

This third-year language and culture course is designed for students who are comfortable speaking and writing German at the GERM 5 level or above. Using a variety of German media sources, students give oral presentations and write reports on contemporary issues. Taught in German.

Prerequisite: Prerequisite(s): GERM 5 or placement by examination.

GERM 120 - Advanced German Conversation and Composition (5)

This third-year language course is designed for students who are comfortable speaking and writing German at the GERM 5 level or above. Using a variety of German texts, including print and visual media, students practice advanced conversation and composition skills. Taught in German.

Prerequisite: Prerequisite(s): GERM 5.

GERM 194 - Group Tutorial (5)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Students submit petition to sponsoring agency.

GERM 199 - Tutorial (5)

Students submit petition to sponsoring agency.

GERM 199F - Tutorial (2)

Students submit petition to sponsoring agency.

GRAD-GRADUATE

Graduate

GRAD 200 - Academic Writing for Graduate Students (0)

Introduces best practices in academic writing including issues of citation, plagiarism, and structure in research. Students receive feedback from instructors and peers in order to encourage a "writing process" and an awareness of student/faculty roles.

Prerequisite: Concurrent enrollment in GRAD 200 and GRAD 202 is required. Enrollment is restricted to international graduate students in the Graduate Preparation Program.

GRAD 201 - Oral Communication for Graduate Students (0)

Focuses on understanding and being understood in seminar style classroom environments, including academic conversation techniques, pronunciation as needed, and using/identifying evidence in discussion. Introduces U.S. classroom approaches to presentation and student-centered teaching and learning.

Prerequisite: Concurrent enrollment in GRAD 200 and GRAD 202 is required. Enrollment is restricted to international graduate students in the Graduate Preparation Program.

GRAD 202 - Reading and Research Skills for Graduate Students (0)

Introduces reading strategies and techniques, including skimming and scanning, note-taking, and text analysis to improve critical reading skills. Also introduces students to UCSC library resources as well as the basic research skills of gathering and analyzing evidence.

Prerequisite: Concurrent enrollment in GRAD 200 and GRAD 201 is required. Enrollment is restricted to international graduate students in the Graduate Preparation Program.

GREE - GREEK

Lower-Division

GREE 1 - Elementary Ancient Greek (5)

Instruction in the grammar of Attic Greek, together with readings from ancient authors, designed to prepare for the study of classical literature. The sequence begins in the fall quarter only.

GREE 2 - Elementary Ancient Greek (5)

Instruction in the grammar of Attic Greek, together with readings from ancient authors, designed to prepare for the study of classical literature.

Prerequisite: Prerequisite(s): GREE 1, or permission of instructor.

GREE 99 - Tutorial (5)

Students submit petition to sponsoring agency.

GREE 99F - Tutorial (2)

Students submit petition to sponsoring agency.

HAVC - HISTORY OF ART AND VISUAL CULTURE

Lower-Division

HAVC 10 - Introduction to African Visual Culture (5)

An interdisciplinary approach to the study of the basic structures (gender, art within political sphere, and spiritual aspects of visual culture) and cultural institutions (initiations, closed associations, kingship, title association, etc.) around which the study of African visual culture revolves.

HAVC 20 - Visual Cultures of Asia (5)

An introduction to the art and architecture of East Asia, including China, India, Southeast Asia, and Japan. In order to achieve a fuller understanding of the arts of these countries a historical, cultural, and religious context is provided.

HAVC 22 - Religion and Visual Culture in China (5)

Introduction to the study of religious currents and practices in China and their visual expression. In addition to religious art, topics include such pivotal matters as body concepts and practices, representations of the natural world, and logics of the built environment.

HAVC 24 - Southeast Asia Visual Culture (5)

Introduces the visual cultures of Southeast Asia. Topics include indigenous megalithic art, textiles, and jewelry, as well as Hindu and Buddhist art and architecture. Also considers shadow

play and dance performance as alternative lenses to looking at ritual and visual narratives rendered on stone temples.

HAVC 27 - Image and Ideology in Indian Art (5)

Examination of the ways social, religious, and political patronage have affected the production and reception of art in the Indian subcontinent. The course is designed as a series of case studies from different periods of Indian history.

HAVC 30 - Introduction to European Visual Culture (5)

General survey of European art and architecture with a focus on the southern, Mediterranean ancient cultures. Course consists of a number of case studies of works from various periods from ancient to modern.

HAVC 35 - European Visual Culture in a Global Context 1500-1900 (5)

Survey of the visual and material products of European contact with Africa, Asia, Oceania, and the Americas between 1500 and 1900 focused both on object-specific case studies and thematic discussions of contact, colonialism, appropriation, and the visual construction of race.

HAVC 40 - Museum Cultures: The Politics of Display (5)

Explores the history of collecting and displaying art (museums, galleries, fairs) since the mid-19th century and the effect of institutional changes on aesthetic conventions. Follows the history from the origins of museums and collections to contemporary critiques of institutional exclusion and misrepresentation.

HAVC 41 - Introduction to Modern Art (5)

Examines the social, economic, and political significance of European and U.S. modernist art and architecture, moving from French realism to American minimalism. Provides the historical background and theoretical frameworks needed to make sense of modernist art and culture.

HAVC 43 - History of Modern Architecture (5)

Examines the origins and development of modern architecture, from the Enlightenment and the Industrial Revolution to the 20th Century and beyond. Buildings, urban plans, and works of art and design are discussed in relation to political, social, and cultural currents.

HAVC 44 - Designing California: Architecture, Design, and Environment (5)

Introduces the complex interplay between design—including architecture, art, engineering, and city planning—and conceptions of environment during the 20th Century in the American West.

HAVC 45 - Photography Now (5)

Explores recent methods and approaches in photography. Surveys significant aesthetic, conceptual, and theoretical shifts occurring in the photographic medium and related discourses. Special attention given to the current landscape of contemporary photography (1980-present).

HAVC 46 - Introduction to U.S. Art and Visual Culture (5)

Overview of U.S. art and visual culture from the late 18th Century to the present. Examines art as evidence for understanding evolving beliefs and values of Americans. Explores the social and political meanings of art, and pays particular attention to how artists, patrons, and audiences have constructed nationalism, race, class, sexuality, and gender.

HAVC 47 - Introduction To Contemporary Art (5)

Introduces students to major debates and practices in contemporary art from 1960 to the present. Not a strict chronological survey or exhaustive catalogue, the course attends to movements and theoretical frameworks that still fuel contemporary practice and criticism.

HAVC 48 - Climate Justice Now! Art, Activism, Environment Today (5)

As climate change grows more severe, artists and activists are creating strategies of consciousness-raising, mass mobilization, and sustainable living. This course investigates the convergence of climate justice and cultural politics, exploring imperatives for a just transition to a post-carbon future.

HAVC 49 - From Memes to Metadata: an Introduction to Digital Visual Culture (5)

Introduction to digital visual culture including critical and historical approaches to memes; social media and politics; and the many intersections of data, images, and society. Sample topics include: digital art, digital activism, and surveillance.

HAVC 50 - Ancient Mediterranean Visual Cultures (5)

The role that ancient art and visual culture play in constructing social identities, sustaining political agendas, and representing various cultural, ritual, and mythological practices in Mesopotamia, Egypt, Greece, and Rome, including the sociology of ancient cultures, mythology, religious studies, gender studies and history.

HAVC 51 - Greek Eyes: Visual Culture and Power in the Ancient Greek World (5)

The central role of visual communication in ancient Greek civilization: examines the construction of cultural, social, political, religious, and gender identities through material objects and rituals. Includes discussions of images of the public and private sphere, athletic and theatrical performances, mythology, pilgrimage, and magic.

HAVC 55 - Unclothed: The Naked Body from Antiquity to the Present (5)

The human body without clothing in European and European-American art and visual culture from ancient Greece to the present day. Among the themes to be addressed: gender, youth and age, sexuality and sexual preference, fecundity and potency, erotic art and pornography, primitivism and the naked body of the non-European. (Formerly HAVC 31, The Nude in the Western Tradition.)

HAVC 58 - Gardens of Delight: Fifteen Centuries of Islamic

Visual Culture (5)

Examines some of the most representative creations of Islamic visual culture from the 7th Century to the present in order to appreciate the richness of this tradition and its extensive influence on other cultures. Focuses on the social, political, and religious role of a variety of materials, from mosques, palaces, and gardens to visual narratives, ceremonies, dance, and contemporary films.

HAVC 60 - Indigenous American Visual Culture (5)

Selected aspects of art and architecture of the first peoples of the Americas, north, central, and south, from ca. 2000 B.C.E. to present. Societies to be considered may include Anasazi, Aztec, Inca, Northwest Coast, Maya, Navajo, Plains, and others.

HAVC 64 - Indigenous North American Materiality and Resistance (5)

Through case studies of contemporary and historical practices, course examines the rich visual cultures of the United States and Canada. Students learn about the role artists play in resisting colonization and sustaining community knowledge.

HAVC 65 - Native American Art and the Environment (5)

Introduces students to the work of Native American artists that either reflects environmental knowledge or which reacts against threats to natural resources. By studying current issues such as fossil fuel extraction, invasive species, and wildfires, students learn how artists contend with threats to their ancestral homelands and how art functions as a powerful medium for raising awareness of these challenges.

HAVC 70 - Visual Cultures of the Pacific Islands (5)

Interdisciplinary course examines visual cultures of Australia, Melanesia, Micronesia, and Polynesia from the archaeological past through contemporary periods.

HAVC 80 - Colonial Histories and Legacies: Africa, Oceania, and the Indigenous Americas (5)

The arts and visual cultures of selected cultures that developed outside the spheres of influence of major European and Asian civilizations, with an emphasis on the history and influence of colonialism in creating current ethnic and racial categories.

HAVC 85 - Introduction to Global Architecture (5)

Introduces the study of architecture and the built environment from a global perspective, focusing on architecture's relation to themes, such as ritual, power, the city, technology, and climate.

HAVC 99 - Tutorial (5)

Supervised study for undergraduates. Students submit petition to sponsoring agency.

Upper-Division**HAVC 100A - Approaches to Visual Studies (5)**

Introduction to major issues of method and critique in study of art and visual culture. Focuses on understanding disciplinary

and critical modes of scholarly inquiry in the visual arts, including role of historical research. Emphasizes intensive reading, discussion, and writing. HAVC 100A is a prerequisite for all History of Art and Visual Culture seminars.

Prerequisite: Prerequisite(s): satisfaction of Entry Level Writing and Composition requirements. Enrollment is restricted to sophomore, junior, and senior History of Art and Visual Culture majors and minors.

HAVC 110 - Visual Cultures of West Africa (5)

Explores visual cultures of West Africa through time (Nok to present). Attention paid to relationships between peoples and impact of European/Arab presence on visual cultures. Prerequisite(s): HAVC 10 or HAVC 80 recommended.

HAVC 111 - Visual Cultures of Central Africa (5)

Examination of visual cultures of Central Africa within a historical sequence from the Sanga archaeological excavations to contemporary easel painting.

Prerequisite: Prerequisite(s): HAVC 80 suggested. Enrollment is restricted to sophomores, juniors and seniors (recommended).

HAVC 115 - Gender in African Visual Culture (5)

In Africa, relationships exist between gender and visual culture. Course examines where categories come from, differences in men's and women's visual cultures, and how visual cultures teach, reinforce, and negotiate gender definitions. When are male/female boundaries crossed, and why?

HAVC 116 - African Architecture (5)

Study of the built environment in Africa. The course explores the diversity of architectural types and how gender, politics, religion, and culture shape and are shaped by architectural spaces and how the natural environment shapes the built environment.

HAVC 117 - Contemporary Art of Africa (5)

Examines contemporary arts in post-colonial Africa, 1960-present, including new popular cultural forms; arts resulting from new class and national structures; commodification of culture; Pan-Africanism; exhibitionism; and questions of destiny.

Prerequisite: Enrollment is restricted to sophomores, juniors, and seniors.

HAVC 118 - Art of the Contemporary African Diaspora (5)

Considers contemporary art by African artists operating in metropolitan centers, as well as Afro-British, Afro-Caribbean, and African-American production. Topics are organized thematically and address constructing and deconstructing the idea of Africa; cultural authenticity; diaspora; Creolite and creolization; hybridity; cosmopolitanism; post-black; and globalism in the arts.

Prerequisite: Background in history of art and visual culture recommended. Enrollment is restricted to sophomores, juniors, and seniors.

HAVC 119 - Arts and Politics of African Urban Space (5)

Using contemporary art and other visual materials, examines how select African cities are structured, imagined, and contested, and how migration, colonialism, race, ethnicity, and globalization inform their spatial politics. Draws from urban studies, political theory, memoir, anthropology, and visual studies.

HAVC 122A - Sacred Geography of China (5)

An examination of the close relationship of religious traditions and the natural world in China, and its expression in visual representation. Particular emphasis on the ways in which competing groups sought to define or re-envision an understanding of the terrain.

Prerequisite: Enrollment is restricted to sophomores, juniors, and seniors.

HAVC 122B - Constructing Lives in China: Biographies and Portraits (5)

Consideration of biographies and portraits in China as representations of human types and individuals, and the use of these representations as models for constructing lives. Attention to historical and social contexts, early times to present. Special focus on Chinese Buddhist traditions. A previous course that focuses on traditional China or Buddhist studies strongly recommended.

HAVC 122C - Writing in China (5)

Examines material and conceptual phenomena of writing in Chinese visual culture. Focuses on the intersections of places and practices of writing through various inscribed sites, ranging from oracle bones, seals, and mountain facades to hand scrolls, architecture, and contemporary art.

HAVC 122D - Chinese Landscape Painting (5)

Examines the history and significance of the subjects most prominent in Chinese painting during the past one thousand years, focusing on the cultural factors that made landscape a fundamental value in the Chinese tradition and the methods whereby painters created pictorial equivalents.

HAVC 122F - Bodies in Chinese Culture (5)

Introduces images, thoughts, and practices of bodies in Chinese culture. In China and Taiwan, the body is to be cherished, adorned, nourished, cultivated, and gazed upon, but also disciplined, altered, and controlled. Examines texts and images of the Chinese body in relation to religion, gender, ethnic politics, martial arts, sports, nationalism, food, medicine, and death. No knowledge of the Chinese language is required.

HAVC 123A - Modernity and the Arts of India (5)

Deals with artistic responses to the forces of modernity, colonialism, industrialization and globalization in India during the 19th and 20th centuries. Addresses the complex and often painful climb toward re-establishing a truly Indian artistic identity. (Formerly Modernity and Nationalism in the Arts in India.)

HAVC 123B - Religions and Visual Culture of South Asia (5)

South Asia is the home of many religions (Hinduism, Buddhism, Jainism, Islam, and Sikhism). Introduces the role images (painting, sculpture, architecture, photography, film) play in shaping these diverse religious traditions.

Prerequisite: Enrollment is restricted to sophomores, juniors, and seniors.

HAVC 124A - Arts of Ancient Southeast Asia (5)

Focuses on Hindu and Buddhist arts of ancient Southeast Asia (Indonesia, Cambodia, Vietnam, and Thailand). Materials covered include indigenous megalithic arts, stone sculptures, and monumental temple architecture such as Angkor Wat, Borobudur, Prambanan, and the Bayon.

Prerequisite: Enrollment is restricted to sophomores, juniors, and seniors.

HAVC 124B - History of Photography in Southeast Asia (5)

Examines how photography was used in Southeast Asia to document the racial difference and the exotic Others under the regime of colonialism. Considers the role photography played in documenting the Vietnam-American War and how contemporary Southeast Asian-American artists challenge this photographic history in their art.

Prerequisite: Enrollment is restricted to sophomores, juniors and seniors.

HAVC 124C - Arts and Politics in Theravada Traditions (5)

Consideration of the arts and architecture in Theravada Buddhist traditions in Sri Lanka and Southeast Asia. Topics and themes include ritual, relics, visual narrative, mural painting, contemporary art, mass-meditation movement, and political protest.

Prerequisite: Enrollment is restricted to sophomores, juniors, and seniors.

HAVC 124D - Contemporary Art of Southeast Asia and its Diaspora (5)

Examines the respective national notions of modernity in the region through a comparative lens. How global capital flow and transnational cultural exchanges impact the production of arts of Southeast Asia and its diaspora. Themes and issues include: colonialism and art education; nationalism; identity politics; memory; trauma; gender; race; sexuality; and the body.

Prerequisite: Enrollment is restricted to sophomores, juniors, and seniors.

HAVC 124E - Southeast Asian-American and Diasporic Visual Culture (5)

Focuses on Southeast Asian refugee visual culture in the United States. Themes and issues include: trauma; memory; the politics of race and ethnicity; gender and sexuality; and the politics of inclusion and exclusion from the nation-state.

HAVC 127A - Buddhist Visual Worlds (5)

Introduction to the study of Buddhist visual traditions, from their beginnings to the present day. Case studies examined with careful attention to historical, social and cultural contexts; particular emphasis on the relation of visual traditions to Buddhist practices.

Prerequisite: Enrollment is restricted to sophomore, junior, and senior students.

HAVC 127B - Buddhist Pure Lands (5)

Explores Buddhist imaginative worlds of the "pure lands": worlds in outer space, sacred mountains, internal states of mind. Study of related practices, including expression and representation of these concepts in paintings, scriptures, poetry, and built environments. Focus is on Chinese traditions.

HAVC 127C - Ritual in Asian Religious Art (5)

Examination of interaction between image and ritual in Asian religious art. Case studies from different historical periods and geographical locations (e.g., China, Tibet, Japan, Indonesia, India). Examples include mandalas, ritual bronzes, tankas, sacred caves, temples, tea ceremonies, and calligraphy.

HAVC 127D - Storytelling in Asian Art (5)

Combination of theoretical perspectives on narrative from literary criticism, rhetoric, folklore, and film theory with art historical focus on images (cave temples, stone reliefs on stupas, scrolls, dance-drama, etc.) from India, Pakistan, China, Japan, Cambodia, and Indonesia.

HAVC 127E - Modern/Contemporary Architecture of the Asia Pacific (5)

Examines 20th- and 21st-century architecture in the Asia Pacific. Examines how aesthetic, socio-political, economic, and technological networks have contributed to Asia Pacific's dynamic and experimental approaches to contemporary architecture.

HAVC 127F - The Politics of Exclusion: Asian American Visual Culture (5)

Examines Asian American artists as well as representations of Asian Americans through U.S. history. Addresses such themes as migration and dislocation, race and identity, intergenerational relationships, origins and diasporas, and American foreign policies in Asia.

HAVC 133A - Themes in the Study of Medieval Visual Culture (5)

Many issues associated with contemporary artistic production and visual culture originated in the Middle Ages. Themes to be considered: role of secular art; women as artists and patrons; aesthetic attitudes; relationship between cultures in holy war, crusade, and pilgrimage.

HAVC 135B - German Art, 1905-1945 (5)

Expressionism, agitprop, the Bauhaus, New Objectivity, attacks on modernism, National Socialist realism. Painting, sculpture,

graphic art, and some architecture and film, studied in the context of political events from the eve of World War I to the end of World War II.

HAVC 135D - Art, Revolt, and Revolution in Europe 1750-1850 (5)

Lecture course focusing on the dynamics of art and politics in France, Britain, and to a lesser extent Spain, from 1750 to 1850. This period of dramatic social change gave rise to new conceptions of subjectivity, freedom, nationhood, and the public address of visual culture. (Formerly French Painting, 1780-1855.)

HAVC 135E - Jewish Identity and Visual Representation (5)

An exploration of the theoretical and practical or experiential applications of Jewish identity in European visual representation. Brief background on pre-emancipation textual and cultural issues followed by study of the Jewish subject and Jewish subjectivities in modernity.

Prerequisite: Enrollment is restricted to juniors and seniors.

HAVC 135F - Art of the Book in Western Europe 500-1600 (5)

The history of European books circa 500-1600, primarily medieval, illuminated manuscripts and the first years of printing. Focuses on the relationship between text and image. Topics include techniques of book production, the archeology of the book, and the life and travels of individual books. (Formerly course 191R.)

HAVC 135G - Blood, Guts, and Gore: Representing War from Leonard da Vinci to Abu Ghraib (5)

Examines images of war from 1400 to the present. Class discusses the many aspects of war while considering major painters of the last 600 years, including da Vinci, Rubens, Goya, Picasso. Class also discusses Callot, Marinetti, etc., and other media, including film, photography, and public monuments.

HAVC 135H - Topics in European and Euro-American Visual Culture (5)

Consideration of how and why Europeans in Europe and Europeans and European-Americans in North America blended nature and human response between 1600 and the present in a variety of media and practices (painting, maps, photography, tourism, film, scouting, artist colonies).

HAVC 135K - Art and Science in Europe 1500-1900 (5)

Examines a select number of case studies from 1500-1900 to see how thinkers and makers relied upon science and art to help them understand the world, asking how have scientists and natural philosophers used art to make their claims more convincing, how have artists relied on scientific research to do the same, and what practices do they have in common.

HAVC 135L - Nineteenth-Century Europe in Prints (5)

Focuses on the public lives of printed pictures in Europe between 1789 and 1914. In lectures and in written assignments, the class analyzes how artists created works in multiple, which

were then circulated by publishers and dealers and consumed by viewers across Europe. In-class discussions compare 19th-century print cultures to our current practices of engaging socially with digital images to see what each illuminates about the other.

HAVC 135P - Paris, Capital of the 19th Century (5)

Examines the places, spaces, practices, and representations of Paris in the 19th century. Tracing the changing face(s) of Paris by way of its literary and visual representations, students consider the experiences and constructions of the modern city.

HAVC 137A - Northern Renaissance Art (5)

Considers the painting and prints produced in Northern Europe in the 15th and 16th centuries. Major issues include the status of realism and classicism, the role of religion and religious reform, and the rise of popular imagery.

HAVC 137E - Renaissance Prints (5)

Examines the issues surrounding the technology and uses of printed images from the early Renaissance through the end of the early modern period. Topics may include the political, religious, and satirical uses of prints and the representation of women in prints.

HAVC 140A - America in Art (5)

Introduction to American visual arts: architecture, painting, photography, sculpture, and performance art, from the nineteenth through the twenty-first century. Explore social and political meanings of art and what art reveals about our nation's values and beliefs, in particular, gender and race.

HAVC 140B - Victorian America (5)

Examines how American writers and artists negotiated complexities of U.S. society during the 19th century. Emphasis on issues ranging from women's rights to laissez-faire capitalism, and from Reconstruction to manifest destiny. Considers how the era's cultural products provided artists, patrons, and audiences with metaphorical coping strategies to counteract what Victorians perceived to be the period's overwhelming social and political changes.

HAVC 140C - Race and American Visual Arts (5)

Investigation of the role played by visual arts in fashioning the racial identities of European-Americans, African Americans, Asian Americans, Native Americans, and Latinos in the United States.

HAVC 140D - Chicano/Chicana Art: 1970-Present (5)

Taking the terms Chicano and Chicana as a critical framework, addresses cultural and conceptual themes in visual art production since 1970. Questions concerning aesthetics, identity, gender, and activism in painting, photography, murals, and installation art explored.

HAVC 140E - Art and Science in America: Contact to circa 1900

(5)

Examines the relationship between art and scientific inquiry in American visual culture from earliest European exploration through the 19th century, when new scientific theories and technological advancements challenged earlier modes of understanding vision, spirituality, and the physical world.

HAVC 140P - Pop Culture as High Art (5)

Examines how Pop Art and popular culture in the United States were (re)formulated into public icons that challenged the visual and ideological associations between high and low art.

HAVC 141A - Modern Art: Realism to Cubism (5)

Modern art in Europe and America, 1848-1914. Consideration of painting, graphic arts, and sculpture in Realism, Impressionism, Post-Impressionism (Symbolism) Art Nouveau, Fauvism, and Cubism as well as exploration of photography's changing status and influence.

HAVC 141B - Death, Desire, and Modernity (5)

Explores war, consumption and desire in the art of the 20th century. From Paris to New York, Cubism to Feminism, explores the relationship between the visual arts and intellectual movements such as psychoanalysis, existentialism, and phenomenology with particular attention to racial and sexual politics.

HAVC 141C - Modern Art: Pop to Present (5)

Surveys the art forms and critical ideas that have shaped artistic practice from the 1950s to the present, including an overview of the socio-political, economic, and cultural forces that inspire artists to articulate human experience in visual form. Examines how popular culture in the post-war United States became intertwined with visual art, forming into the artistic genre known as Pop Art. This important aesthetic shift challenged the political, ideological, and representational value systems that inform our understanding of so-called "high art."

HAVC 141E - Histories of Photography (5)

Introduction to the histories of photography and the critical debates around different photographic genres such as medical photography, art photography, and political photography. Students will develop a critical language in order to analyze photographs while considering the importance of social and institutional contexts.

HAVC 141F - The Camera and the Body (5)

Through the study of historical and contemporary visual texts (from ethnography and portraiture to advertising and erotica), this course explores how photographic images of the body, while masquerading as natural, self-evident, or scientific, participate in highly coded sign systems that influence who looks at whom, how, when, and why.

HAVC 141H - Media History and Theory (5)

An introductory examination of the writing about the issue of medium and media theory in visual culture. Technologies, discourses, and practices from all periods that use the

comparison of media as a major approach to understanding the problems of the visual are highlighted. New media, film, television, video, traditional arts are also treated.

HAVC 141I - Be Here Now: Art, Land, Space (5)

From the "happenings" of the late 1950s to contemporary ecological art, this course will examine temporary, site-specific projects of the U.S and Western Europe. Students will be introduced to theories of public art and the social production of space, and invited to explore practices that change the role of the audience, remake museum spaces, situate art in nature, or transform urban life.

HAVC 141J - Critical Issues in Contemporary Art and Visual Culture (5)

Explores how theory can illuminate various forms of cultural production from art and cinema to popular and material cultures. Considers how scholars and visual producers utilize theory creatively and in the study of aesthetic objects and experiences.

HAVC 141K - Activist Art Since 1960: Art, Technology, Activism (5)

Students explore art and technology produced for social change since 1960 within the context of major historical ruptures, such as the Vietnam War, the women's movement, environmental protection, AIDS activism, anti-capitalist, and international human rights movements.

HAVC 141L - Museums in the Internet Era (5)

Explores the world of museums in the age of digital technologies and the Internet. Key themes include digital repatriation, social media, interactivity, participation, net art, and digital aesthetics.

HAVC 141M - Museum Practices (5)

How are museums organized, categorized, visited? How are objects physically handled, documented, and displayed? Course explores various concepts upon which museum practices are based and the impact these concepts have on society and cultures.

HAVC 141N - Data Cultures: Art, Technology, and the Politics of Visual Representation (5)

Through critical readings, interactive assignments, and primary sources, this course explores cultural and political issues around data, emphasizing the impacts of relevant technologies and practices on art and visual culture. Sample topics: digital art, critical mapping, social media, and surveillance.

HAVC 141O - Sex, Lies, and Surveillance: Contemporary Documentary Arts (5)

Focuses on contemporary experiments in artistic documentary practice, including photography and digital imagery, moving-image media, and artistic installations. Considers artistic case studies and leading theoretical and critical elaboration in relation to international cultures of documentary practice.

HAVC 141P - Networks and Natures: Art, Technology, and the

Nonhuman (5)

Through critical readings and primary sources, this course explores the historical and theoretical developments in the interactions of art, culture, nature, and technology. Sample topics include environmental art; media infrastructures; concepts of nature and the nonhuman; and climate change and visual culture.

HAVC 142 - Contemporary Art and Ecology (5)

Investigates contemporary art and the politics of ecology. Examines the intersection of art criticism, politico-ecological theory, environmental activism, and postcolonial globalization, considering geopolitical areas diverse as the Arctic, Nigeria, Bangladesh, India, Europe, and the Americas.

HAVC 142M - Museum Exhibitions (5)

Students work in collaborative teams to create and install an exhibition. Students take the roles of museum departments, moving the project from concept to installation. The impact exhibitions make in culture and society is examined throughout each step of the process. (Formerly History of Art and Visual Culture 191M).

HAVC 143A - Contemporary Architecture and Critical Debates (5)

Examination of practitioners, projects, issues, and theories in contemporary architecture circa 1968 to the present. Topics include the architecture of aftermath, the ethics of memory and memorialization, the corporatization of museums, the role of criticism and exhibitions, and the cult of the brand-name architect.

HAVC 143B - History of Urban Design (5)

Examines urban design from the Renaissance to the present, including Latin American colonial cities, Utopian plans, and sites such as Brasilia and Chandigarh. The course focuses on social justice, diversity, and the role of art and architecture.

HAVC 143C - Latin American Modern Architecture (5)

Presents Latin America's modern architecture with relation to colonization; the influence of immigrants from Europe, Africa, and Asia; the presence of indigenous cultures; and the search for autonomy. Case studies include Argentina, Brazil, Chile, Mexico, Venezuela, and Uruguay.

HAVC 143D - Architecture and the City in Modern and Contemporary Visual Culture (5)

Examines the modern and contemporary depictions of cities in visual and material culture, from paintings and photographs to logotypes and souvenirs. Also examines the roles of narrative in spatial representations, including literature, film, and television productions.

Prerequisite: Enrollment is restricted to juniors and seniors.

HAVC 143E - History of Design: The Objects of Technology,

1850-The Present (5)

Traces the connections between key movements in modern design and the evolution of technology in society. Also provides a framework for engaging critically with the proliferation of technology in society today.

HAVC 143F - Memory, Place, and Preservation in Modern Architecture (5)

How have architects engaged with ideas of memory and place in architectural projects and built landscapes from the 18th century to the present? This course examines topics such as memorializing, erasure of place, historic preservation, and cultural heritage in modern architecture. (Formerly Memory, Place and Architecture.)

Prerequisite: Enrollment is restricted to sophomores, juniors, and seniors.

HAVC 143G - After Utopia: Architecture and the City, 1968-Present (5)

Explores critical issues in the history of architecture and urbanism from 1968 to the present. Major themes in the development of contemporary architecture are introduced, including the uneven legacy of modernism, the growth of cities, changing technologies, environmental issues, and the social and political context of design.

HAVC 144A - Latin American Art and Visual Culture (5)

Investigates Latin American and Caribbean art and visual culture. Studies decolonial resistances, alternative modernisms, examining the shaping of race and ethnicity under global capitalism. Looks at practices by Latin American and Latinx artists, focusing on Afro-Latinx and indigenous knowledges.

HAVC 151 - Greek Myths Antiquity to the Present (5)

Myths dominated the culture and visual production of the ancient Greek world, and their presence is still strong today. How did they codify social, political, and religious realities and needs? How were they perceived in different time periods? In addition to ancient Greek and Roman and later European sculptures and paintings, this course considers less conventional sources, such as modern films, comics, and advertisements. HAVC 51 recommended as preparation.

HAVC 152 - Roman Eyes: Visual Culture and Power in the Ancient Roman World (5)

Visual culture in the ancient Roman world, from temples and public monuments to houses and tombs, performances, and rituals. Examines the construction of social and cultural identities, including class, gender, and sexuality, through architecture, sculpture, painting, household objects, jewelry, etc.

HAVC 153 - Neither Venus Nor Virgin: Women's Lives Beyond Men's Constructs in Late Antiquity and Byzantium (5)

Explores the lives of women in Late Antiquity and Byzantium through a critical analysis of primary visual and textual sources, most of which were produced by men. Looking beyond social

expectations, we attempt to understand female experiences and agency.

HAVC 154 - Byzantine Visual Culture: Politics and Religion in the Empire of Constantinople, 330-1453 A. C (5)

Centered on the capital city of Constantinople (modern Istanbul), the Hellenized and Christianized Roman Empire of the Eastern Mediterranean today known as Byzantium played a major, yet often overlooked, role in European history for more than a millennium. This course examines its visual production and relation to politics and religion in court and church ceremonial, expressions of Christian faith, and cultural interactions with Western Europe, Islam, and the Slavic world.

HAVC 155 - Constructing Cleopatra: Power, Sexuality, and Femininity Across the Ages (5)

The construction of female identity and the production of history through the myth of Cleopatra. Critical analysis of archeological data and ancient sources, later sculptures and paintings, and contemporary films, movies posters, Internet sites, advertisements, comics, games, dolls, and household objects.

HAVC 157B - Italian Renaissance: Art and Architecture (5)

Lives of Italian Renaissance people from birth to death, examining the nature and roles of the institutions which defined human existence in this period. Uses visual arts both illustratively and to study how institutions fashioned their images through art and architecture.

HAVC 157C - High Renaissance (5)

An investigation of the High Renaissance as a period and stylistic concept, using the major artists and monuments of the period 1480–1525 to discuss issues of theory, history, and art. Artists considered include Leonardo da Vinci, Michelangelo, and Raphael.

HAVC 157D - Art of the Venetian Renaissance (5)

Considers Venetian art in the 15th and 16th centuries. Topics include major artists (the Bellini, Carpaccio, Titian, Tintoretto, Veronese, Palladio) and the relationship of the city to outside forces (Byzantine Empire, Turkish Empires) and other Italian cities.

HAVC 160A - Indigenous American Visual Culture Before 1550: Mexico (5)

Art and architecture of selected pre-Hispanic cultures from the Gulf coast, central, western, and southern Mexico including the Olmec, Zapotec, Toltec, Mixtec, Mexica (Aztec), and others.

HAVC 160B - Indigenous American Visual Culture Before 1550: The Andes (5)

The art of selected pre-hispanic cultures of Colombia, Ecuador, Peru, and Bolivia including the Nazca, Moche, Chimu, and Inca.

HAVC 162A - Advanced Studies in Early Indigenous American

Visual Culture: The Ancient Maya (5)

The art and architecture of the Maya of southern Mesoamerica from the first century C.E. to ca. 1500. HAVC 80, HAVC 60, or HAVC 160A (formerly HAVC 150A) are recommended as preparation.

HAVC 162B - Advanced Studies in Early Indigenous American Visual Culture: The Inka (5)

The visual culture of the Inka of the Andean region of western South America including textiles, metalwork, and the built environment. HAVC 60 or HAVC 80 are recommended as preparation.

HAVC 163 - The Native in Colonial Spanish America (5)

Indigenous contributions to colonial Spanish American visual culture including architecture, manuscripts, sculpture, painting, textiles, feather-work, and metallurgy. Focus on colonial Mexico, the Andes, and California.

HAVC 164A - Art and Visual Culture of Indigenous California (5)

Examines the diverse art and visual culture of California's Indigenous communities, by learning about historic practices and revitalization, artistic engagement with the built environment, performance and public art, activism through visual culture, and the deconstruction of stereotypes.

HAVC 165 - Indigenous Artists and the Borderland Missions (5)

The Missions of California, Arizona, New Mexico, Texas, Georgia and Florida impacted the lives of Indigenous peoples who were vital to the artistic and architectural development of these spaces. Course examines Indigenous contributions and ongoing reactions to these sites.

HAVC 170 - Art of the Body in Oceania (5)

Explores art of the body, defined broadly, from various perspectives. Examines colonial representations of Oceanic bodies, self-representation through bodily adornment and display (including tattoo, scarification, body painting, ornament, and dress), and bodily metaphors in Oceanic visual cultures.

HAVC 172 - Textile Traditions of Oceania (5)

Investigates how textiles contribute to cultural fabric of Oceania. Explores women's roles in socioeconomic exchanges and cultural production; gender issues regarding production and function of Oceanic textiles; and history of processes, functions, and aesthetics. Prerequisite: Prior coursework related to Oceania recommended.

HAVC 178 - Museums and Cultural Heritage in Oceania (5)

Examines representations of Pacific Island cultures. Explores the history of indigenous communities' relationships with museums and heritage institutions, and strategies to represent Oceanic histories, knowledges, and futures. Studies how stakeholders in cultural representation develop collaborative approaches to pursuing decolonized heritage practices.

HAVC 179 - Topics in Oceanic Visual Culture (5)

Examines selected and changing topics in the study of oceanic visual culture. The specific topic varies with each offering in order to keep up with recent directions in scholarship. Possible topics include: archaeological material and visual cultures; colonial-era images, objects, and spaces; architecture and environments; performance; gender; race and ethnicity; modern/contemporary art and visual culture; and/or a regional focus.

HAVC 180A - Contemporary Art in a Globalized World (5)

Examines major developments in art and theory, 1980s-present. Close consideration of how artists from around the globe innovatively respond to often fraught social, political, and economic circumstances. Topics include: experimental social relations, diaspora, migration, decolonization, institutional critique, globalization, the commons, and ecology. (Formerly Global Contemporary Art.)

HAVC 185 - Community Engagement Through the Arts (5)

Explores a variety of professional practices related to art history and visual studies. Focuses on critical issues central to community-engaged professional practice. Topics include: museums and communities, art and civic engagement, managing visual archives and collections, art law, cultural property, heritage preservation, art conservation, community arts organizations, public art, arts administration, academia, pedagogy, the vital role of the arts and the humanities in contemporary life. (Formerly Art and Community: Arts Professions and Community Engagement.)

HAVC 186 - Horror and Gender in Art and Visual Culture (5)

Explores the theme of horror in 20th/21st-Century visual culture. Unpacks how horror is often reflective of entrenched cultural anxieties around the interplay between gender, morality, and female sexuality.

HAVC 186I - Indigenous Art and Activism (5)

Examines how indigenous artists and activists visually respond to issues related to land and sovereignty. Looks at a broad range of media used by indigenous creative practitioners, including documentary filmmaking, printmaking, photography, and performance.

HAVC 186Q - Queer Visual Culture (5)

Students gain critical skills to grapple with queer art, visual culture, and theory of diverse histories and geographies. Students consider how queer is applied and appropriated in the scope of in/visibility in a transnational context.

HAVC 188A - Introduction to Curatorial Studies (5)

Investigates display histories of natural, ethnographic, and historical objects as well as contemporary art curation practices. Explores how curatorial methodologies can reinforce or challenge inequalities implicit in choosing what and how objects are seen.

HAVC 188B - Biennials and Mega-Exhibitions (5)

Explores the recent history of curatorial practice. Through studying important exhibitions produced in recent decades, students learn about the range of social, political, and economic factors influencing how art is conceived and displayed today.

HAVC 188C - Site-Specific Art, Installations, Artists and Institutional Practice (5)

Examines key moments and projects in site-specific art since the 1960s, including Earth Works, the rise of installation art, and the interplay between artists and institutional venues sponsoring such projects, including museums, private galleries and patrons, and biennials.

HAVC 188M - Heritage, Memory, and Material Culture (5)

Ideas of heritage suggest fixed origins and stable histories yet are changing and plural in human life. Course considers materials from around the world to explore how concepts of heritage address the present through commemorating (or forgetting) the past.

HAVC 190A - African Art and Visual Culture (5)

Advanced seminar requiring intensive research and writing on changing topics related to a specific area of African art and/or visual culture chosen to demonstrate critical mastery of this subject.

Prerequisite: Prerequisite(s): HAVC 10 or HAVC 80.

HAVC 190B - Play and Ritual in Visual Cultures (5)

Compares how play and ritual construct worlds and regulate visual cultures—from dolls to ritual objects and performances. Attention given to areas where play and ritual overlap and the visual cultures that result.

HAVC 190C - The Mediterranean from the Rise of Christianity to the Rise of Islam (5)

Examines the visual culture of the Mediterranean from the 3rd to the 7th centuries A.D., focusing on the historical and cultural developments which led to the survival of the Eastern Roman Empire and its transformation to what we call Byzantium.

HAVC 190D - The World of the Lotus Sutra (5)

Close study of the principal text of East Asian Buddhism as a self-enclosed vision of reality, with careful consideration of the forms and functions of the world of visual and aural representation that it has inspired.

Prerequisite: Prerequisite(s): HAVC 127A or by permission of instructor.

HAVC 190E - Huayan Visions (5)

Explores the distinctive conceptual world of the Buddhist Huayanjing (Avatamsaka-sutra) and its expression in visual forms. This long text, composed in Sanskrit and later translated into Chinese, is a principal scripture of the international Mahayana Buddhist traditions of Asia.

Prerequisite: Prerequisite(s): HAVC 127A or by permission of instructor.

HAVC 190F - Chan Texts and Images (5)

Examines selected issues in history of Chan (Zen) Buddhist traditions in China from medieval times to the present day. Concepts, methods, and visual expression of Chan practice situated through study of texts and visual materials.

Prerequisite: Prerequisite(s): HAVC 127A or by permission of instructor.

HAVC 190G - Buddhist Wisdom Traditions (5)

Careful study of Mahayana Buddhist perfection-of-wisdom traditions—texts and related material culture, including visual imagery and illustrated books—with focus on the particular vision of reality that they aim to produce or reveal.

Prerequisite: Prerequisite(s): HAVC 127A or by permission of instructor.

HAVC 190J - Visual Cultures of the Vietnam-American War (5)

Examines the visual culture of the Vietnam-American war and its legacy in contemporary art of Southeast Asia. Considers representations in different media: painting, drawing, photography, film, novels, and material cultures. Issues addressed include memory, trauma, identity politics, body, race, gender, pornography, and prostitution.

HAVC 190K - Thematic Approach to Visual Cultures of Southeast Asia and Its Diaspora (5)

Undergraduate seminar that takes topical and thematic approaches to looking at the visual cultures of Southeast Asia and its diaspora. Media and themes include textile, film and literature, comparative modernity, race, gender, and sexuality. The specific topic and them varies from year to year.

HAVC 190M - Representations of Women in Indian Art (5)

Deals with representations of the female divinity in Indian religious imagery, and of women in secular and courtly paintings. Also examines roles women play in the production of art in the Indian subcontinent.

HAVC 190N - Topics in Mediterranean Visual Culture (5)

Examines selected and changing topics in the study of Mediterranean visual culture. Topics vary with each offering to keep up with recent directions in scholarship. Possible topics: Bronze Age Aegean cultures; myth, ritual, and religion in the Near East; Greek and Roman gender and sexuality; seafarers and cross-cultural interactions in the ancient Mediterranean; Islamic cultures of North African and Spain.

HAVC 190O - Berlin: History and the Built Environment (5)

Explores Berlin's urban and architectural history through themes: the meaning of memory in architecture; the political and cultural implications of preservation, globalization, and tourism. Because these questions are relevant beyond Berlin, course draws comparisons with other cities.

HAVC 190P - Death and Patriotism: The Case of the French Revolution (5)

What are the relations between the mortal body and politics in times of crisis? What purposes can death, or the threat of death, serve? Examines representations of executions, assassinations, and funerals during the French Revolution, with an emphasis on the Terror.

HAVC 190Q - Portraiture: Europe and America, 1400-1990 (5)

Western portraiture and self-portraiture at certain key moments (early modern Italy, 16th-century Germany, 17th-century Holland, France from the reign of Louis XIV to the Revolution, contemporary U.S.) are explored by reading 20th-century interpretations and some primary sources. This course can be taken for senior exit credit only by permission of the instructor.

HAVC 190S - New Directions in Contemporary Art (5)

Explores how critical theory illuminates forms of cultural production, from art and cinema to popular culture. Considers how scholars, artists, and filmmakers use critical theory both creatively and in the study of aesthetic objects and experiences.

HAVC 190T - Topics in Pre- and Post-Columbian Visual Culture (5)

Seminar on changing topics related to the current scholarship on pre-Hispanic and colonial Spanish American visual culture.

HAVC 190U - Word and Image in Illuminated Byzantine Manuscripts (5)

Religious, scientific, and secular manuscripts of Byzantium: examines how words and images interacted to express and promote central concepts of Byzantine culture; serve liturgical needs of private devotion; reflect imperial ideals; diffuse moral values and knowledge; and proclaim social status and cultural affiliations.

HAVC 190V - Cult of Mary in Byzantium (5)

Why did the cult of the Virgin Mary become so important in Byzantine culture? Examines historical, cultural, theological, political, and social reasons for this development, seen through the interaction of Byzantine visual culture and literature.

HAVC 190W - Art and Culture Contact in Oceania (5)

Examines impact of culture contact on Oceanic and Euro-American visual cultures in context of discovery, colonialism, and postcolonialism. Topics include 18th-century visual culture, colonial identities, primitivism, syncretism, impact of Christianity, contemporary art/market, media, tourism, transnationalism, and globalization. Prior coursework related to Oceania recommended but not required.

HAVC 190X - Art and Identity in Oceania (5)

Theoretical discussions and Pacific Basin case studies on 1) definitions of cultural, ethnic, and national identities; 2) relationship between art, museums, and construction of historical and cultural narratives; 3) ways tradition defined in art practices and used by groups to assert an identity in their present. Participants first develop a theoretical framework and

vocabulary for analyzing artistic production in a variety of cultures. Through specific case studies, will explore how art, architecture, and museums actively contribute to define and challenge ethnic and national identities. Prior course work related to Oceania recommended but not required.

HAVC 191A - Iconoclasm (5)

What happens when, to control an object, it is destroyed? Examines destruction of art as a way of ending the object's life cycle, as a device of social tension/change, and as a colonial and post-colonial mechanism of religious/political control.

HAVC 191B - The Virgin of Guadalupe: Images and Symbolism in Spain, Mexico, and the U.S (5)

Focus on the histories of miraculous images of La Virgen de Guadalupe de Extremadura (Spain) and La Virgen de Guadalupe de Tepeyac (Mexico). The foundations and growth of the cult of the Mexican Guadalupe during the colonial period is examined along with the multivalent symbolism of her image. Considers contemporary appearances of the Virgin of Guadalupe, from the miraculous images on a tree in central California and the compositions of Chicano artists, to mass-produced kitsch.

HAVC 191C - Subalternatives: Representing Others (5)

Explores how visual representation (in fine art, popular art, film, and television) encodes difference in selected cultural and historical contexts. Considers (post)colonial image-making both as a strategy of domination as well as resistance.

HAVC 191D - Semiotics and Visual Culture (5)

How can visual culture be understood as the production, circulation, and recirculation of signs? This course offers a history of semiotics and its methodological application in the analysis of images in popular culture and within the discipline of art history.

HAVC 191E - Feminist Theory and Art Production (5)

A close reading of works of art and theoretical texts by feminists working from 1970 to the present. The course encourages debate around the past, present, and future relevance of feminist theories to visual cultural studies, paying particular attention to issues of cultural and ethnic difference.

HAVC 191F - Image and Gender (5)

Examines what visual representations (feminine and masculine) reveal of gender in 19th- and 20th-century European and American culture; how images reflect norms of gender; and how we are conditioned to read images in gendered terms. Explores how femininity and masculinity were conceived during historical periods and how gender ideals changed in response to social, political, and economic pressures. Students encouraged to consider the fluid nature of 21st-century notions of ideal femininity and masculinity and possible alternatives.

HAVC 191G - Art, Cinema, and the Postmodern (5)

Considers the relationship between art, cinema, and postmodernism. Specific, thematically oriented topics are considered including: the impact of cinema aesthetics on contemporary art; film and digital technology; cinematic structure as cultural critique; and filmic strategies as an ideological tool.

HAVC 191I - Topics in Architecture and Urban History (5)

Focuses on selected topics in the history of art and visual culture. Topics vary depending on instructor.

HAVC 191K - Decolonial Visual Culture (5)

Examines contemporary visual culture and processes of decolonialization in relation to topics including: petroculturalism, indigeneity, ecology, race, gender and sexuality, and multispecies ontology. Case studies include cultural practices in North America and Mexico, with diverse theoretical approaches.

HAVC 191L - Topics in Native American Visual Culture: Indigeneity and Pop Culture (5)

Examines the history of racist imagery and stereotypes that have shaped public perception of Indigenous American peoples. From imperialist propaganda through current-day manifestations, class examines the negative impacts misrepresentations have on Native communities and Indigenous responses.

HAVC 191N - Topics in Renaissance Art and Visual Culture (5)

Seminar on changing topics related to the current scholarship on the art and visual culture of the Renaissance.

HAVC 191O - Topics in Oceanic Visual Culture (5)

Seminar on current scholarship on Oceanic visual culture. Topics include pre-colonial, colonial, and post-colonial visualities; place and the built environment; performance; race; gender; travel and tourism; cultural institutions. Prior coursework related to Oceania recommended but not required.

HAVC 191P - Topics in Contemporary Art (5)

Addresses changing topics in contemporary art. The specific topic varies with each offering to keep up with new directions in scholarship.

HAVC 191S - Topics in American Art and Visual Culture (5)

Advanced seminar requiring intensive research and writing on changing topics related to a specific area of American art and/or visual culture chosen to demonstrate critical mastery of this subject.

HAVC 191U - City on a Hill: The Architecture of the Campus (5)

Explores the history of campus design in North America. Traces the ways designers have used the campus for staging new ideas of education and work, stimulating social relations,

and connecting architecture with the natural world. Emphasis is devoted to UCSC and the Silicon Valley tech campus.

HAVC 191V - The Edge of the Sea: Architecture and Design on the California Coast (5)

The history of architecture and design along the California coast. Through a series of case studies selected from topics in twentieth century design, course explores the roles of designers in mediating relationships between infrastructure and landscape, technology and natural forces, ideas of the artificial and natural, as well as between humans and non-human species.

HAVC 191W - Art, Disaster, and Resilience (5)

Explores how art and other visual cultural practices--like participatory mapping, data visualization, and image sharing--negotiate the material and social consequences of both sudden and slow-moving disasters. Emphasizes critical, activist, and regenerative methods of representation, collaboration, and response.

HAVC 193F - History of Art and Visual Culture Service Learning (2)

Integrates academic study with meaningful community service to enrich the learning experience, teach civic responsibility, and strengthen communities. Projects may serve non-profit agencies, schools, or art/culture institutions. Enrollment is restricted to junior and senior history of art and visual culture majors and minors. Enrollment is by instructor permission.

HAVC 195 - Senior Thesis (5)

Students submit petition to sponsoring agency.

HAVC 198 - Independent Field Study (5)

Independent field study away from the campus. Students submit petition to sponsoring agency.

HAVC 198F - Independent Field Study (2)

Independent field study away from the campus. Students submit petition to sponsoring agency.

HAVC 199 - Tutorial (5)

Individual study in areas approved by sponsoring instructors. Students submit petition to sponsoring agency.

HAVC 199F - Tutorial (2)

Individual study in areas approved by sponsoring instructors. Students submit petition to sponsoring agency.

Graduate**HAVC 201A - Introduction to Visual Studies and Critical Theory (5)**

Introduces the visual studies discipline, providing students with an overview of the field's development, its primary texts, and its issues of central concern. Features intensive readings and student-led discussions.

Prerequisite: Enrollment is restricted to graduate students.

HAVC 202 - Introduction to Visual Studies Methods (5)

Examines research methods and approaches in a variety of materials, cultures, periods, and subjects that are relevant in the discipline of visual studies. Discussions focus on research and readings by history of art and visual culture faculty who share practices, experiences, and advice.

Prerequisite: Enrollment is restricted to graduate students.

HAVC 204 - Grant Writing (5)

Devoted entirely to writing grant proposals. Students work on grants for educational support, their doctoral dissertation grants, or both.

Prerequisite: Enrollment is restricted to visual studies graduate students or by permission of the instructor.

HAVC 205 - Grant Writing in Visual Studies (3)

Devoted to grant-writing. Students work on composing and peer-reviewing research proposals, personal statements, bibliographies, CVs, and writing samples. Readings include literature on grant-writing and scholarly writing in the humanities.

Prerequisite: Enrollment is restricted to visual studies students or by permission of the instructor.

HAVC 212 - Yoruba Visualities and Aesthetics (5)

Yoruba conceptions of visibility are explored and compared to seeing through Western eyes. Critical reading focuses on Western and Yoruba scholars' work on visualities and complementary theoretical writings on Yoruba aesthetics and philosophy.

Prerequisite: Enrollment is restricted to graduate students.

HAVC 213 - Theories and Visual Cultures of Iconoclasm (5)

Examines theories that attempt to explain iconoclasm, the willful destruction of religious or political objects, by applying the theory (including theories of cultural heritage) to various case studies. The universal aspect of iconoclasm and the differences in understanding and practice are explored.

Prerequisite: Enrollment is restricted to graduate students.

HAVC 220 - Topics in Asian Visual Studies (5)

Examines selected and changing topics in the visual studies of Asia. The specific topic varies with each offering to keep up with recent directions in scholarship.

Prerequisite: Enrollment is restricted to graduate students.

HAVC 222 - The Image of Arhat in China (5)

Indian Buddhist sage-monks (arhats) are portrayed in China in ways that represent a remarkable variety of visual/historical/practice traditions. This seminar examines these depictions and explores the ranges of means and functions attached to this theme.

Prerequisite: Enrollment is restricted to graduate students.

HAVC 224 - Engaged Buddhism and Visual Culture (5)

Begins with an analysis of photography and films capturing the Gandhian and Dalit movement in India. Students then read key Buddhist texts on engaged Buddhism, and look at the rise of engaged Buddhism in Southeast Asia in the 1960s and how it impacted modern and contemporary art in Southeast Asia and its diaspora.

Prerequisite: Enrollment is restricted to graduate students.

HAVC 230 - Race, Aesthetics, and Art in 18th Century Europe (5)

Looks at the 18th-century connections of theories of beauty to practices of art-making, the production of knowledge about the natural world, and the construction of race. Students discuss not only the debates of this era but the impacts they have made on the study of visual culture.

Prerequisite: Enrollment is restricted to graduate students.

HAVC 232 - The Monument Since 1750 in Relation to Nationhood and the Experience of War (5)

Investigates modern monuments (1750 to present) and the creation or maintenance of a nation, especially in terms of war and its immediate aftermath. Destruction or alteration of monuments and production of anti- or counter-monuments are also examined.

Prerequisite: Enrollment is restricted to graduate students.

HAVC 233 - Topics in Contemporary Art and Visual Culture (5)

Examines selected and changing topics in the contemporary art and visual culture. The specific topic varies with each offering to keep up with recent directions in scholarship.

Prerequisite: Enrollment is restricted to graduate students.

HAVC 235 - Photography and History (5)

Investigates the complex relationship between photography and history. Considers the evolving perceptions of photography's capacity to capture reality, the discursive means by which photographic truths are produced, and the utility of photographs as primary evidence.

Prerequisite: Enrollment is restricted to graduate students.

HAVC 236 - Contemporary Art and Theories of Democracy (5)

Interdisciplinary approach to the study of democratic political theory of the last two decades and its relation to contemporary art practice with an emphasis on activist art, public art, and theories of speech and performance.

Prerequisite: Enrollment is restricted to graduate students.

HAVC 240 - Seeing Race (5)

Investigates how discursive systems racialized the sight of various racial and ethnic groups in 19th- and 20th-century U.S. society. Focuses on the construction and maintenance of racial values systems and on the historically specific ways in which an eclectic assortment of visual artifacts have been read by groups

over time. Considers the visual and material implications of race-based sight.

Prerequisite: Enrollment is restricted to graduate students.

HAVC 241 - Decolonizing Nature: Contemporary Art and Ecology (5)

Considers how visual culture intersects with environment. Considers how, in the age of neoliberal globalization, documentary and neo-conceptual practices confront the biopolitics of climate change; the financialization and rights of nature; climate refugees; and indigenous ecologies.

Prerequisite: Enrollment is restricted to graduate students.

HAVC 242 - Radical Futurisms (5)

Examines and compares radical futurisms-Indigenous, Afro, Chicana/Latinx, multispecies, Postcapitalist-and situates them in relation to experimental visual cultural, media, and aesthetic practices, asking critical and creative speculative questions about what comes after end-of-world narratives.

Prerequisite: Enrollment is restricted to graduate students.

HAVC 243 - Alternative Architecture (5)

Focuses on what is commonly left out of architectural history: the ephemeral, informal, illegal, and uncertain. Topics include: anonymous and collective architecture; temporary interventions; everyday urbanism; and vestigial urban spaces. These topics are understood through theories of space as socially produced (Henri Lefebvre, Michel de Certeau, among others), and through cultural movements and manifestoes (Situationist International, Aesthetics of Hunger, etc.)

Prerequisite: Enrollment is restricted to graduate students.

HAVC 244 - Reinventing "Reinventing Nature:" Visual Culture and Environmentalism, circa 1995 (5)

Departing from an interdisciplinary seminar held at the UC Humanities Research Institute in 1994 entitled "Reinventing Nature," course engages discourses around ecology, technology, environmental politics, and visual representation that emerged in the 1990s through debates about the idea of nature.

Prerequisite: Enrollment is restricted to graduate students.

HAVC 245 - Race and Representation (5)

Explores how human subjects come to be visually defined and marked by race discourse. Covers diverse theoretical literatures on the topic, primarily in visual studies, but also in cultural studies, post-colonial studies, and psychoanalysis.

Prerequisite: Enrollment is restricted to graduate students.

HAVC 249 - How to Do Things with Pictures: Media, Culture, and Performance (5)

An interdisciplinary exploration of the performative dimensions of art, visual culture, and new media. Investigates theories of performance and action across multiple fields and considers

their relevance to themes, problems, and contexts of interest to those enrolled.

HAVC 250 - The Cult of Mary in Byzantium: Visualities of Political, Religions, and Gender Constructs (5)

Through the study of the Byzantine cult of Mary, we examine diverse modalities in the construction and interaction of political, religious, and gender values, and we investigate the interrelated role of images, rituals, and text in human experience, expression, and communication.

Prerequisite: Enrollment is restricted to graduate students.

HAVC 260 - Visual Literacy in Spanish America, 1500-1800 (5)

Visual literacy is considered as a particular predicament of colonial societies. Students consider the legibility of artifacts in colonial Spanish American contexts given its culturally diverse audiences and examine specific instances of (mis)interpreted images and transcultured representations.

Prerequisite: Enrollment is restricted to graduate students.

HAVC 264 - Contemporary Native American Art (5)

Seminar focusing on the work of contemporary Native American artists. Students explore ecological activism, the relationship of Native artists with the art market and factors that shape artistic production, and what it means to be an Indigenous artist.

Prerequisite: Enrollment is restricted to graduate students.

HAVC 270 - Colonial Cultures of Collecting and Display (5)

Examines collections and exhibitions of colonized people, places, and objects through primary sources, theoretical texts, and analytical case studies (with some emphasis on Oceania). Focuses on visual discourses of race, science, religious conversion, colonial settlement, nation-building, education, and entertainment.

Prerequisite: Enrollment is restricted to graduate students.

HAVC 273 - Imaging Colonial Borderlands (5)

Considers 18th-century to 21st-century colonialisms, especially in Oceania. Concentrates on representations conditioned by particular cross-cultural engagements in colonial peripheries rather than focusing on metropolitan representations. Explores the construction and transgression of rigidly defined colonial identity categories, as expressed in visual/material form. (Formerly offered as Imaging Colonial Peripheries and Borderlands.)

Prerequisite: Enrollment is restricted to graduate students.

HAVC 275 - The Visual Cultures of Travel and Tourism (5)

Explores the visual cultures of travel and tourism with some focus on Oceania. Travel and tourism are implicated in the histories of colonialism, ethnography, and globalization, and offer rich sites for critical engagement with theories of transnationalism, imperialism, diaspora, and identity.

Prerequisite: Enrollment is restricted to graduate students.

HAVC 280 - Visual Studies Issues (5)

Examines selected and changing issues in visual studies. The specific issue varies with each offering to keep pace with recent directions in scholarship.

Prerequisite: Enrollment is restricted to graduate students.

HAVC 282 - Art of Independence, Liberation and the Cold War (5)

Explores art movements that played a role in major struggles for independence and liberation from colonial regimes or reflected upon them subsequently. These art movements are examined through international art and media exhibitions. Case studies vary with each course offering.

Prerequisite: Enrollment is restricted to graduate students.

HAVC 294 - Teaching-Related Independent Study (5)

Directed graduate research and writing coordinated with the teaching of undergraduates. Students submit petition to sponsoring agency.

HAVC 295 - Directed Reading (5)

Directed reading that does not involve a term paper. Students submit petition to course-sponsoring agency. Enrollment is restricted to graduate students.

HAVC 297A - Independent Study (5)

Independent study or research for graduate students. Students submit petition to sponsoring agency.

HAVC 297B - Independent Study (10)

Independent study or research for graduate students. Students submit petition to sponsoring agency.

HAVC 297F - Independent Study (2)

Students submit petition to course-sponsoring agency. Enrollment is restricted to graduate students.

HAVC 299A - Thesis Research (5)

Students submit petition to course sponsoring agency. Enrollment is restricted to graduate students.

HAVC 299B - Thesis Research (10)

Students submit petition to course sponsoring agency. Enrollment restricted to graduate students.

HEBR - HEBREW**Lower-Division****HEBR 1 - First-Year Hebrew (5)**

Speaking, listening comprehension, reading, and writing fundamentals. The use of Modern Hebrew is encouraged through classroom practice supplemented by work with computer tutorials. The first-year sequence (1-2-3) begins in fall quarter only.

HEBR 2 - First-Year Hebrew (5)

Speaking, listening comprehension, reading, and writing fundamentals. The use of Modern Hebrew is encouraged through classroom practice supplemented by work with computer tutorials.

Prerequisite: Prerequisite(s): HEBR 1 or by consent of instructor.

HEBR 3 - First-Year Hebrew (5)

Speaking, listening comprehension, reading, and writing fundamentals. The use of Modern Hebrew is encouraged through classroom practice supplemented by work with computer tutorials.

Prerequisite: Prerequisite(s): HEBR 2 or by consent of instructor.

HEBR 4 - Second-Year Hebrew (5)

Development of the students' familiarity with the spoken and written language through grammar review, discussions, and vocabulary building. Varied readings on literary and cultural topics related to modern Israel.

Prerequisite: Prerequisite(s): HEBR 1B or HEBR 3 or by consent of instructor.

HEBR 80 - Introduction to Biblical Hebrew (5)

Introduces students to the basic lexicon and grammatical structures of biblical Hebrew, with an emphasis on the development of a set of useful translation strategies. Throughout the course, students apply their emergent skills to translating a variety of biblical texts.

HEBR 94 - Group Tutorial (5)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Students submit petition to sponsoring agency.

HEBR 99 - Tutorial (5)

Students submit petition to sponsoring agency.

HEBR 99F - Tutorial (2)

Students submit petition to sponsoring agency.

Upper-Division**HEBR 194 - Group Tutorial (5)**

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Students submit petition to sponsoring agency.

HEBR 199 - Tutorial (5)

Students submit petition to sponsoring agency.

HEBR 199F - Tutorial (2)

Students submit petition to sponsoring agency.

HISC - HISTORY OF CONSCIOUSNESS

Lower-Division

HISC 1 - Introduction to History of Consciousness (5)

Investigates the politics of identity and recognition as the basis for claims about institutional legitimacy and social struggle. Examines such diverse figures as Sartre, Fanon, Bataille, Foucault, Lacan, Levinas, Derrida, Deleuze, Zizek, and Badiou.

HISC 80V - Introduction to Marxism (5)

The goal of this course is to introduce students to the thought of Karl Marx and some of the major thinkers working in the Marxist tradition. The majority of the course centers on Marx's writing, though students also read texts that extend and develop Marx's ideas into areas that Marx himself did not explore. Course addresses questions central to the Marxist tradition: What is capital? What is capitalism? What is a capitalist state? How did Marx understand colonialism and national liberation struggles? What is the specific nature of gendered oppression and exploitation under capitalism? What is the relationship between capitalist production and cultural production?

HISC 12 - Historical Introduction to Philosophy (5)

Focuses on moral, metaphysical, and epistemological issues using classical texts along with some contemporary readings on related philosophical problems. Plato, Kant, and Sartre provide the central readings on ethics, while Descartes, Hume, Kant (again), and Wittgenstein provide the central metaphysical and epistemological discussions. Issues of philosophy of language and method are highlighted throughout.

HISC 60A - What is Revolution? (5)

Studies the modern concept of revolution. Course proposes to inquire into the concept of revolution, insurgency, revolt and resistance in theory and practice. The course aims to analyze thinkers such Thomas Hobbes, Jean-Jacques Rousseau, Immanuel Kant, G.W. F. Hegel, Karl Marx, Carl Schmitt, Hannah Arendt, V.I. Lenin, Rosa Luxemburg, and the revolutionary declarations from the French Revolution to the Zapatista insurgency.

HISC 60C - What Is Resistance? (5)

Explores the politics of resistance and how different thinkers have conceptualized what it means to resist, why it is necessary, and with what methods it should be done. Side by side with the theorists of resistance, the course analyzes examples of resistance from around the world, traversing different time periods, geographies, and cultures. Examples range from peasant revolts to labor movements, feminist struggles to anti-war mobilizations, prisoner uprisings to anti-colonial wars and contemporary forms of corporeal, self-sacrificial resistance. Relying upon the concrete political problems posed by each historical instance as springboards into larger theoretical concerns, the course focuses on questions such as the nature of power relations, different forms of political organization and representation, the relationship between means and ends, the

role of violence, and the function of different media, especially as they become manifest in the complexity of real politics.

HISC 70 - Gandhi and Us (5)

Places the anti-imperial radical and thinker Mohandas Gandhi in the context of twentieth-century global politics, philosophy, and history. Studies political and philosophical history through the global prism of empire and modernity.

HISC 80N - Prophecy Against Empire (5)

In the core of a London slum, with wars raging all around him, the printer William Blake sounded the trumpet of prophecy. This course channels Blake's war-time revelations, laying bare the antinomies of imperial violence and the prophetic tradition.

HISC 80O - Understanding Popular Music (5)

Students develop the skills necessary to analyze popular music. First, challenging common-sense understandings of how music functions. And second, understanding how history works its way into musical forms.

HISC 80P - The Black Panther Party: History and Theory of a Political Movement (5)

Examines the history and theory of the Black Panther Party (BPP). Texts situate the historical conditions leading to the BPP's rise; theoretical inspirations and contributions; national and international reach; and decline following state repression, electoral campaigns, and guerrilla warfare.

HISC 80R - Urban Consciousness: Life, Inequality, and the City (5)

Investigates the social, spatial, and economic inequalities that mark urban life in the United States. Focuses on broad debates and narratives about progress, development, race, creativity, and justice, tying these large themes to how the contemporary American city is produced, governed, and imagined.

HISC 80S - War and the Media (5)

Examines how war is represented in journalism using perspectives from political theory, intellectual history, and related fields. Materials aim to challenge media depictions, from the Civil War to the War on Terror, assessing how news shapes knowledge of conflict.

HISC 80T - What is the Witch: Terror, Subjectivity, Modernity (5)

What is the witch? A historical person? A vestige of pre-colonial European ancestry? A cultural object whose image and identity are shaped by film, paintings and literature. Class considers the witch's development in Europe. Also reviews the witch as a tool of racial, economic and social stratification in society. By looking at how the witch is represented through visual and literary culture, students develop an understanding of the witch as a historic symbol of shifting relations of gender, class and power.

HISC 80U - Labor and Globalization (5)

Examines how the integration of global trade, finance, and production networks has affected the lives of workers, with a particular emphasis on workers in (or from) the Global South. Each unit focuses on a particular aspect of working-class experience—migration, precarity, and coercion, successively.

HISC 85 - Politics and Religion (5)

Considers both the religious sources of political ideas and the political sources of religious ideas, addressing topics, such as sovereignty, justice, love, reason, revelation, sacrifice, victimhood, evil, racism, rebellion, reconciliation, and human rights.

Upper-Division**HISC 102 - Philosophy and Poetics (5)**

Introduction to the relationship between philosophy and poetics in some major 19th- and 20th-century poets and thinkers.

Prerequisite: Enrollment restricted to juniors and seniors.

HISC 103 - The Problem of California (5)

From Muir Woods to Hollywood and Silicon Valley to the Central Valley, California has been a path breaker that has shaped politics and cultural production. The state's rich diversity makes it an especially exciting site for studying the relations between divergent social, economic, cultural, political, and ecological forces. Course investigates the histories, cultures, and geographies of California by exploring relations between power and place through ethnographic, archival, critical, and aesthetic lenses. Also examines the role of identity within constructions of inequality and struggles for political change. Course fulfills one upper-division course requirement for the minor in the history of consciousness.

HISC 104 - Political Writing (5)

Explores the politics of writing by moving beyond rehearsals of established form into an analysis of the politics of writing, asking: What are the philosophical and political implications of the writing forms we choose?

HISC 105 - Antisocial Media (5)

Provides an introduction to critical scholarship on media infrastructures with a focus on cybernetic systems, internet protocol, surveillance, logistics, and finance. It explores how these configurations of power are reorganizing our societies and restructuring our subjectivities.

HISC 106 - The U.S. Horror Film: Race, Capitalism, and Monsters (5)

Analyzes films and images to consider how the genre of horror has screened the problems, expectations, and fantasized afterlives of racism, labor exploitation, ruin, and war.

HISC 107 - The Idea of Reality (5)

What are we asserting or seeking when we make a claim about reality? What criteria divide the real from the unreal, what

authorities have power to make this designation, and under what conditions, if any, can the boundary be crossed? Course explores the idea of reality and resonances between writing and films ranging from the serious to the whimsical. Through these juxtapositions course explores what underlying concepts, if any, could unite political "realism" with realism in art, or what common qualities these realisms might share with the "real number system," virtual reality, or reality TV.

HISC 108 - Parables for a Warming Planet: The Politics of Climate Change (5)

Takes up the literary form of the parable to illuminate a pressing and complex problem: the threat of global climate change. How can the simplest of stories help us to explore our options for a planetary future?

HISC 109 - Liberalism and Violence (5)

Explores the meanings of modernity, religion, and violence and examines the conceptual status that war and sovereignty, long associated with religious belief, have since been accorded within the modern humanist and secular tradition. Also explores aspects of this tradition and their relationship to questions of morality and violence and how violence-and its relationship to secularism-can be better understood today as a mode of negotiating human existence in a world dominated by technology and its myths.

Prerequisite: Enrollment is restricted to juniors and seniors.

HISC 110 - Histories of the Atom (5)

This interdisciplinary course considers the atom in four respects: as philosophical idea, as weapon, as catastrophe, and as clock. Students will learn about ancient atomisms, radiometric dating, the Manhattan Project, the bombing of Hiroshima, and the Chernobyl nuclear disaster.

HISC 111 - States, War, Capitalism (5)

Survey of seminal work on ancient origins of the state, diverse geo-political systems of war and diplomacy, and consequences of the formation of the world market on the evolution of geo-political systems up to and beyond the wars of today.

Prerequisite: Enrollment restricted to juniors and seniors.

HISC 112 - Foundations in Critical Theory (5)

Concentrates on the Marxist tradition of critical theory, centering on classical texts by Marx and by writers in the Marxist tradition up to the present.

HISC 113 - History of Capitalism (5)

Surveys major developments in the capitalist world economy from the 13th century to today. Topics include: the transition to capitalism in Europe; the emergence of banking; colonization, slavery, and uneven development; industrialization; and globalization.

HISC 114 - Histories of Miseducation (5)

Examines the history of the idea of "miseducation" through a transnational lens. Focuses in particular on histories of the

(mis)education of people of African descent, drawing on historical cases and theorizations from both the Continent and the diaspora. This class will trace the emergence of the concept and proximate theorizations of "education" itself through an array of different social movements, institutional formations, and texts.

HISC 115 - The Radical Right, A Symptom of Capitalism (5)

Provides the historical context and the theoretical tools necessary for understanding today's radical right. Specific focus on considering the far right in the context of radical constructions under conditions of late capitalism.

HISC 116 - What is Species? (5)

Studies the multiplicity of meanings of the word "species" explored in Donna Haraway's "When Species Meet," including its use in biology, racial and gendered uses, religious and economic meanings. Examines discourses surrounding species from the ancient Greeks through the present.

HISC 117 - Making the Refugee Century: Non-Citizens and Modernity (5)

Examines the material, discursive, and racialized conditions that have produced refugees in the last century. Also examines the social claims made by refugees, institutional responses to them, and political alternatives to state belonging

HISC 118 - What is Money? (5)

Explores what happens if money is examined as a material and politically contingent phenomenon in its own right, rather than assuming the classic "three functions of money" (unit of account, means of exchange, and store of value). Students examine these functions separately with an eye to the tensions that arise between them, and trace a deep history of monetary systems as the outcome of a process of negotiation and contestation. Topics considered include palace economies, cowrie shells, metallic coinages, the modern monetary revolution, and contemporary struggles over student debt.

HISC 119 - Politics of Recognition (5)

Course touches on the philosophical roots of Hegel's text, starting from the pre-World War II rereading of Hegel's master/slave dialectic that became the kernel of postwar thought arising from struggles over capitalism, communism, fascism, racism, colonialism, and feminism.

HISC 120 - What is a State? (5)

Examines the modern concept of state, its anthropological assumptions, categories, its critique, and its crisis. Inquires into the concept of representation, borders, security and control in thinkers, such as Thomas Hobbes, John Locke, Jean-Jacques Rousseau, Immanuel Kant, G.W.F. Hegel, Karl Marx, Carl Schmitt, and Lenin.

HISC 121 - What Is Politics? (5)

Examines the concept of politics, its anthropological assumptions, categories, and its crisis. It proposes to inquire into the concept of politics, justice, conflict and law in thinkers,

such as Aristotle, Plato, Thomas Hobbes, Jean-Jacques Rousseau, Immanuel Kant, Karl Marx, Carl Schmitt, Hannah Arendt, Fanon, and Gandhi.

HISC 125 - Queerness and Race (5)

Gives students a grasp of different definitions and uses of the concept queerness in its relationship to race and how it's tied to the politics of lesbian, gay, bisexual, and transgender (LGBT) identity.

HISC 129 - Politics of Violence (5)

Inquires into the relationship between politics and violence as articulated by early modern, modern, and contemporary political theorists. Investigates the role of violence in the constitution and maintenance of sovereign power and the construction of the modern subject of politics.

HISC 131 - Postcolonial Paths (5)

How postcolonial thought occasions the reconsideration of the Western tradition of political philosophy and the discovery of alternative pathways of modernization within it.

HISC 135 - What is Freedom? (5)

Seminar in modern political thought. The focus and outcome of the course is developing the skill of analytical thinking and clear formulation of concepts in writing. Raises and discusses a set of fundamental questions around the method and methodology of moral and political thought, to which every member in the seminar contributes.

HISC 136 - Latin American Thought (5)

Does Latin American thought have to appeal to quintessential Western philosophical questions regarding knowledge, ethics, reality? Course explores how concepts such as identity and abstraction, as well as realities of indigeneity and diversity, both cause and effect the development of analytical and political frameworks across Latin America. Examines what difference social, political, and ethnic inequality might make to the development of core conceptual and philosophical questions and frameworks.

HISC 140A - Africa: How to Make a Continent (5)

Introduces the histories of exploration, museum collection, and photography that shape historical and contemporary ideas about race, culture, and place in Africa.

HISC 150 - Radical Political Theory (5)

Provides an introduction to classical and contemporary texts of radical political theory, a body of work that critically examines fundamental premises of politics. Addresses the question 'What is the 'political?'

HISC 160 - Advanced Topics in History of Consciousness (5)

Provides students an opportunity for in-depth analysis of advanced topics within the history of consciousness arena. Course topic changes; see the Class Search for current topic.

HISC 163 - Freud (5)

The development of Freud's concept of mind. Extensive reading tracing the origins and development of Freud's theories and concepts (e.g., abreaction, psychic energy, defense, wish-fulfillment, unconscious fantasy, dreams, symptoms, transference, cure, sexuality) and emphasizing the underlying model of the mind and mental functioning.

HISC 166 - Race, Science, and Humanities (5)

Is race a social construct or (partially at least) a biologically grounded reality? Which medical, biological, social, and political agendas are at play with respect to the genomics of race? Genomic results of the past few decades have added significant complexity to the view that race is primarily a social construct. The debates rage, and the stakes are high. Course engages the history, philosophy, and anthropology of the genetics and genomics of race from the 19th century to today, also introducing the basic science on a "need-to-know" basis.

HISC 169 - Blue Humanities: Oceans, Humanity, and the Future (5)

As steerers of planetary climate systems, loci of biodiversity, sources of food, and cradles of inspiration to poets, philosophers, artists, and society in general, the oceans are essential to our future. Course combines history, philosophy, literature, and cinema, using them as lenses through which to analyze, understand, and effect positive change on troubled oceans. Course fits well with UCSC's oceanside location and marine campus.

HISC 185C - Comparative Religion: A Critical Introduction (5)

Introduces the comparative study of world religions and provides critical entry points toward the understanding of its history as a discipline. Special emphasis on the troubled history of imperialism, orientalism, and facile generalizations that have always accompanied the attempt to understand foreign or dead cultures.

Prerequisite: Enrollment is restricted to sophomores, juniors, and seniors.

HISC 185T - Marxism and Feminism (5)

Critically engages with feminist-Marxist perspectives on social-reproduction. Introduces the foundation of Marxism and feminist-Marxist critique while examining the international feminist struggle historically from the origins of capitalism to the present moment.

HISC 187 - The Emergence of the Avant-garde from Disenchantment to Dada (5)

Examines the socio-political and cultural origins of early 20th-century avant-garde movements focusing on the vanguard movement of futurism, the roles played by the disenchantment of the world, and technological rationalization as it relates to warfare and aesthetic production.

HISC 190 - Nature or Nurture? (5)

Examines baseline philosophical and scientific views of human nature in the context of the debate about existence and the role of human nature., Considers whether human nature is singular or plural, genetic or environmental, and what role it plays in political and social thought. Examines race and sex/gender as biological and/or cultural categories and realities. Concludes with explicit attention to theoretical and conceptual frameworks highlighting nurture, the environment, and social construction, vis-a-vis human "nature." As a critical and exploratory course, no ultimate position on human nature is endorsed. Prerequisite(s): HISC 166 and by permission of instructor.

HISC 199 - Tutorial (5)

A program of individual study arranged between an undergraduate student and a faculty member. Students submit petition to sponsoring agency.

Graduate**HISC 203A - Approaches to History of Consciousness (5)**

An introduction to history of consciousness required of all incoming students. The seminar concentrates on theory, methods, and research techniques. Major interpretive approaches drawn from cultural and political analysis are discussed in their application to specific problems in the history of consciousness. Prerequisite(s): first-year standing in the program. See the department office for more information.

HISC 203B - Approaches to History of Consciousness (5)

Writing-intensive course based on readings in HISC 203A.

Prerequisite: Prerequisite(s): HISC 203A. Enrollment is restricted to graduate students.

HISC 205 - Global Political Thought (5)

Seminar anchored in a question fundamental to the history of ideas in the modern history of empire: How to think globally about political thought. Through sustained examinations of classic texts in the history of moral and political philosophy, the seminar explores how the "global" itself becomes a universal framework essential to understanding politics worldwide.

Prerequisite: Enrollment is restricted to graduate students.

HISC 208 - Humanism and its Critics (5)

Examines modern humanism and its critics in a trajectory composed of three moments: foundational texts of 19th century humanism and some of their 20th century interpreters, the critiques of humanism launched by structuralist/post-structuralist continental theory in the 1960s that dealt with the essentialization of the human (theoretical anti-humanism), and contemporary critiques that take issue with anthropocentrism (posthumanism/transhumanism). Students consider thematic that have shaped humanism and the controversies surrounding it including questions of secularism, morality, and materialism, essentialism and class/gender/racial identity, anthropocentrism, and universalism. Readings include Feuerbach, Marx, Sartre,

Heidegger, Foucault, Althusser, Haraway, Braidotti, and Ferrando.

Prerequisite: Enrollment is restricted to graduate students.

HISC 209 - Hegel's Phenomenology of Spirit (5)

Students read Hegel's Phenomenology of Spirit from cover to cover. This book has been critical for many disciplines such as philosophy, politics, psychology, anthropology, sociology

Prerequisite: Enrollment is restricted to graduate students.

HISC 214 - What is a Subject? (5)

Examines major streams of theorization about the subject in postwar and contemporary continental and critical theory. Thinkers include Althusser, Badiou, Balibar, Butler, Fanon, Foucault, Honneth, Laclau and Mouffe, Mbembe, Ranciere, and Sartre.

Prerequisite: Enrollment is restricted to graduate students.

HISC 215 - History of Unconsciousness (5)

There is a history of political consciousness that culminated in the project of enlightenment. There is a history of individual, collective, and political unconscious, which culminated in fascism. These two histories are intertwined, but their outcome is not preconceived. On the contrary, their relationship and integration constitute a field of possibilities for social, political, and human experimentation. This course inquires into the concept of political unconscious by exploring thinkers, such as Kant, Foucault, Adorno, Horkheimer, Freud, Jung, Reich, Fromm, Marcuse, and Klein.

Prerequisite: Enrollment is restricted to graduate students.

HISC 216 - Critical Race/Ethnic Studies (5)

Explores foundational and emergent theoretical and methodological approaches to the study of race. Issues examined include the production of race within and across various spheres of human activity and how race has shaped notions of difference and commonality in the past and present.

Prerequisite: Enrollment is restricted to graduate students.

HISC 217 - Critical Human Rights Theory (5)

Addresses about 10 of the significant critiques of human rights discourse published in the past decade by authors, such as Moyn, Douzinas, Fassin, Ticktin, J. Slaughter, D. Chandler, Mamdani, Weitzman, Badiou, and Meister.

Prerequisite: Enrollment is restricted to graduate students.

HISC 218 - French Hegel (5)

Students expected to locate with fluency and precision their own research projects within the conceptual and methodological frameworks defining the late-20th century constellation of thought to be laid out systematically over the course of the term.

Prerequisite: Enrollment is restricted to graduate students.

HISC 219 - Radical Futures and Visual Culture (5)

Attempts to break through the pervasive dystopia and catastrophism of the present and open up speculative proposals regarding the not-yet and what's to come. Students critically consider methodologies of futurity among varieties of radical imaginaries grounded in the traditions of the oppressed—including Afrofuturisms, Indigenous, Chicana/Latina, multispecies, postcapitalist, and communist proposals—and place them in relation to threatening reactionary, neo-fascist tendencies.

Prerequisite: Enrollment is restricted to graduate students.

HISC 221 - Surveillance Culture: Privacy, Publicity, Art, and Critical Social Practice (5)

Examines how artists and activists are responding by using surveillance technologies to look over "big brother's" shoulder and to create greater awareness of privacy issues. Course pays particular attention to metadata, big data, bio-power, and the relationship between various forms of surveillance with respect to privacy, publicity, and free speech.

Prerequisite: Enrollment is restricted to graduate students.

HISC 222B - Theories of Late Capitalism (5)

Writing-intensive course based on readings in HISC 222A.

Prerequisite: Prerequisite(s): HISC 222A. Enrollment is restricted to graduate students.

HISC 223 - Althusser (5)

Through close readings of Althusser's major texts, this course systematically examines the political and philosophical thought of Louis Althusser and analyzes why he is one of the most important thinkers of the 20th century.

Prerequisite: Enrollment is restricted to graduate students.

HISC 224 - Marx's Capital Vol. 1 (5)

Investigates the many layers of Marx's Capital.

Prerequisite: Enrollment is restricted to graduate students.

HISC 226 - Liberty and Resistance (5)

Examines modern conceptions of liberty from a non-liberal perspective. Proposes to inquire into the concept of liberty as an individual and collective right by exploring its philosophical justifications and criticism in thinkers, such as Kant, Hegel, and Marx.

Prerequisite: Enrollment is restricted to graduate students.

HISC 227 - Carl Schmitt (5)

Provides a careful contextualization and a critically informed interrogation of the major works of Carl Schmitt, a figure at the center of many contemporary debates in political and legal thought.

Prerequisite: Enrollment is restricted to graduate students.

HISC 230A - Poetry, Language, Thought (5)

Introduces the relation between philosophy and poetics in some major 20th-century poets and thinkers.

Prerequisite: Enrollment is restricted to graduate students.

HISC 230B - Poetry, Language, Thought (5)

Writing-intensive course based on readings in HISC 230A.

Prerequisite: Prerequisite(s): HISC 230A, or permission of instructor.

HISC 231 - From System to Fragment (5)

Explores the rise and fall of the philosophical system. It proposes to inquire into the origin of the systematic philosophy, its development, its crisis, and its disintegration. This theoretical trajectory will be investigated together with alternative trajectories in thinkers, such as I. Kant, G. Fichte, Novalis, K.W.F. Schlegel, G.W.F. Hegel, M. Stirner, S. Kierkegaard, K. Marx, F. Nietzsche, L. Wittgenstein, T.W. Adorno, W. Benjamin, Empedocles.

Prerequisite: Enrollment is restricted to graduate students.

HISC 232 - Music, Social, Thought (5)

Examines the various modes through which intellectuals, artists, and other commentators have written about music as a socially situated art as well as the ways they have theorized the social through examinations of musical phenomena. Focus changes with course offering.

Prerequisite: Enrollment is restricted to graduate students.

HISC 236 - 20th Century Critical Theory (5)

Focuses on the critical-theoretical approaches that are associated with an interdisciplinary group of scholars affiliated with the Institute for Social Research, known as the "Frankfurt School". Surveys some of their most important contributions to the critique of capitalism, the authoritarian state, instrumental reason, culture, historical progress, law, and social organization. Discusses whether or not these different works fit together into a single tradition called "critical theory" and what theoretical and political implications the gesture of such naming entails. Investigates the normative foundations of critique and the philosophical influences that shape them. Course also explores the different "generations" of the Frankfurt School and map out the relationship of these thinkers to the traditions of Western Marxism, psychoanalysis, and social theory. Concludes by analyzing the limitations of critical theory and the intellectual challenges it faces in the contemporary world.

Prerequisite: Enrollment is restricted to graduate students.

HISC 237A - Historical Materialism (5)

Students read landmark works of classical and contemporary Marxism. Writings from Marx, Lenin, Trotsky, Lukacs, Gramsci, Adorno, Benjamin, Sartre, Althusser, Anderson, Jameson, and Zizek are addressed.

Prerequisite: Enrollment is restricted to graduate students.

HISC 237B - Historical Materialism (5)

Writing-intensive seminar based on HISC 237A. Students read landmark works of classical and contemporary Marxism. Writings from Marx, Lenin, Trotsky, Lukacs, Gramsci, Adorno, Benjamin, Sartre, Althusser, Anderson, Jameson, and Zizek are discussed.

Prerequisite: Enrollment is restricted to graduate students.

HISC 240 - Basic Principles of University-Level Pedagogy (2)

Provides training for graduate students in university-level pedagogy in general. Under the supervision of the department chair, coordinated by a graduate student with substantial experience as a teaching assistant.

Prerequisite: Enrollment is restricted to graduate students.

HISC 242A - Violence and Phenomenology: Fanon/Hegel/Sartre (5)

Study of the work and influence of Frantz Fanon from a range of viewpoints: existential, phenomenological, psychoanalytic, and political; a variety of genres: film, literature, case history, and critique; and a set of institutional histories: clinical, cultural, and intellectual.

Prerequisite: Enrollment is restricted to graduate students.

HISC 242B - Violence and Phenomenology: Fanon/Hegel/Sartre (5)

Writing intensive course based on readings in HISC 242A.

Prerequisite: Prerequisite: HISC 242A. Enrollment is restricted to graduate students.

HISC 246 - Black Radicalism (5)

Examines the history of black radical intellectual, cultural, political, and/or social movements. May take the form of a survey of different aspects of black radicalism or may focus on a particular individual, groups, period, etc.

Prerequisite: Enrollment is restricted to graduate students.

HISC 248 - Black Critical Theory (5)

Offers a critical introduction and overview of black critical theory across multiple fields and genres. Beginning with the question of race and ontology, students go on to consider questions of sovereignty and domination, freedom and liberation, identity and difference, and conclude with a study of race and the post-human. Major thinkers studied include: Sylvia Wynter, Achille Mbembe, Frantz Fanon, and W.E.B. DuBois, as well as contemporary figures, such as Frank Wilderson, Fred Moten, and Hortense Spillers.

Prerequisite: Enrollment is restricted to graduate students.

HISC 252 - Poststructuralism (5)

French poststructuralism, with particular attention to the main philosophical texts of Jacques Derrida and Michel Foucault. Other representative theorists as well as critics of poststructuralism are studied as time permits.

Prerequisite: Enrollment is restricted to graduate students.

HISC 261 - Modern Intellectual History (5)

Survey of 19th- and 20th-century intellectual history that focuses on a cross-section of major works from Hegel to Levi-Strauss.

Prerequisite: Enrollment is restricted to graduate students.

HISC 262 - Critical Theory After Habermas (5)

Examines key works of Frankfurt School theorist Jurgen Habermas, his followers, and critics, on topics such as the public sphere, the theory of communicative action, power and domination, and religion and secularism.

Prerequisite: Prerequisite(s): Enrollment is restricted to graduate students.

HISC 263 - European Philosophies of Difference (5)

Survey of European philosophies of difference, tracing the evolution of philosophical concepts and frameworks from Nietzsche, Kierkegaard, Bergson, and Heidegger through later 20th-century French post-structuralist, feminist, and Frankfurt School theory.

Prerequisite: Enrollment is restricted to graduate students.

HISC 264 - The Idea of Africa (5)

Examines the position of Africa in cultural studies and the simultaneous processes of over- and under-representation of the continent that mark enunciations of the global and the local. Themes include defining diaspora, the West as philosophy, and Africa in the global economy.

Prerequisite: Enrollment is restricted to graduate students.

HISC 265A - Biopolitics I: Problematics (5)

Focuses on the theorization of life and death in relation to power as proposed by 20th-century thinkers. Investigates how a biopolitical problematic has emerged and what insights into politics it offers. Explores the different ways in which thinkers have conceptualized biopolitics and its broader implications.

Prerequisite: Enrollment is restricted to graduate students.

HISC 265B - Biopolitics II: Corporealities (5)

Focuses on the exploration of biopolitics and necropolitics on the body. Examines how the body has become deeply integrated into power relations in modern society. Also explores different forms of corporeality that are conduits of political struggle and sites of transgression, resistance, and refusal.

Prerequisite: Enrollment is restricted to graduate students.

HISC 268A - Rethinking Capitalism (5)

Readings include works by speakers at UCSC's Rethinking Capitalism Initiative. Topics are: (1) financialization versus commodification (how options-theory has changed capitalism); (2) material markets (how this theory performs); and (3) valuation and contingency (how economies make worlds).

Prerequisite: Enrollment is restricted to graduate students.

HISC 268B - Rethinking Capitalism (5)

HISC 268A addressed changes in the theory and practice of capitalism as derivatives markets have become increasingly central to it. This course, which can be regarded as either background or sequel, concerns questions that surround recent debates about derivatives from the standpoint of broader developments in law, culture, politics, ethics, ontology, and theology. What would it mean to see questions of contingency and value as a challenge to late-modern understandings of these modes of thought?

Prerequisite: Enrollment is restricted to graduate students.

HISC 269 - Property and Possession (5)

Covers modern conceptions of property and their critique. Inquires into the concept of property as an individual right by exploring its philosophical justifications and criticism in thinkers, such as John Locke, Jean-Jacques Rousseau, Immanuel Kant, G.W. F. Hegel, Pierre-Joseph Proudhon, and Karl Marx.

Prerequisite: Enrollment is restricted to graduate students.

HISC 271 - Historical Temporalities (5)

Explores the critique of the unilinear historical time through the prism of Reinhart Koselleck, Walter Benjamin, and Ernst Bloch's attempts to reconfigure the concepts of time and history. During the course, students investigate how time affects both representation of reality and political praxis.

Prerequisite: Enrollment is restricted to graduate students.

HISC 272 - Deprovincializing Marx (5)

Course aims to rethink Marx against the grain, from the debate with Russian populists to Capital and the Grundrisse. Investigates formal subsumption not as a historical stage, but as a form that denotes how capitalism encounters, incorporates, and combines existing modes of production without creating a homogeneous world.

Prerequisite: Enrollment is restricted to graduate students.

HISC 275 - Sovereignties (5)

The guiding thought of this seminar is the question of what is, and is not, sovereign. Exploring a wide range of authors (such as Bodin, Hobbes, Spinoza, Rousseau, Kant, Schmitt, Bataille, and Fanon), this seminar addresses the most salient problems in recent discussions of sovereignty.

Prerequisite: Enrollment is restricted to graduate students.

HISC 285 - Topics in Political Theology (5)

Readings focus on the early 20th-century rediscovery of political theology; its use in theorizations of the Holocaust; and its return in 21st-century debates on empires, war, terror, enmity, reconciliation, fanaticism, human rights, political economy, and global catastrophe. Students cannot receive credit for this course and HISC 85.

Prerequisite: Enrollment is restricted to graduate students.

HISC 291 - Advising (2)

Independent study formalizing the advisee-adviser relationship. Regular meetings to plan, assess and monitor academic progress, and to evaluate coursework as necessary. May be used to develop general bibliography of background reading and trajectory of study in preparation for the qualifying examination.

HISC 292 - Practicum in Composition (5)

A practicum in the genres of scholarly writing, for graduate students working on the *composition* of their qualifying essay or doctoral dissertation.

Prerequisite: Enrollment is restricted to graduate students.

HISC 293A - Field Study (5)

Research carried out in field settings, based on a project approved by the responsible faculty. The student must file a prospectus with the department office before undertaking the research and a final report of activities upon return.

HISC 293B - Field Study (10)

Research carried out in field settings, based on a project approved by the responsible faculty. The student must file a prospectus with the department office before undertaking the research and a final report of activities upon return.

HISC 293C - Field Study (15)

Research carried out in field settings, based on a project approved by the responsible faculty. The student must file a prospectus with the department office before undertaking the research and a final report of activities upon return.

HISC 294A - Ind Study-Teaching (5)

Directed graduate research and writing coordinated with the teaching of undergraduates. Students submit petition to sponsoring agency.

HISC 294B - Ind Study-Teaching (10)

Directed graduate research and writing coordinated with the teaching of undergraduates. Students submit petition to sponsoring agency.

HISC 294C - Ind Study-Teaching (15)

Directed graduate research and writing coordinated with the teaching of undergraduates. Students submit petition to sponsoring agency.

HISC 295 - Directed Reading (5)

Systematic working through a prearranged bibliography which is filed as a final report at the end of the quarter with the signature of the instructor. Students submit petition to sponsoring agency.

HISC 295A - Directed Reading (5)

Systematic working through a prearranged bibliography which is filed as a final report at the end of the quarter with the signature of the instructor. Students submit petition to sponsoring agency.

HISC 295B - Directed Reading (10)

Systematic working through a prearranged bibliography which is filed as a final report at the end of the quarter with the signature of the instructor. Students submit petition to sponsoring agency.

HISC 295C - Directed Reading (15)

Systematic working through a prearranged bibliography which is filed as a final report at the end of the quarter with the signature of the instructor. Students submit petition to sponsoring agency.

HISC 296 - Special Student Seminar (5)

A seminar study group for graduate students focusing each quarter on various problems in the history of consciousness. A statement and evaluation of the work done in the course will be provided each quarter by the students who have participated in the course for that quarter, and reviewed by the responsible faculty.

HISC 297A - Independent Study (5)

Independent study and research under faculty supervision. Students submit petition to sponsoring agency.

HISC 297B - Independent Study (10)

Independent study and research under faculty supervision. Students submit petition to sponsoring agency.

HISC 297C - Independent Study (15)

Independent study and research under faculty supervision. Students submit petition to sponsoring agency.

HISC 298 - Doctoral Colloquium (5)

Under the supervision of a History of Consciousness faculty member, students finishing their dissertation meet weekly or bi-weekly to read and discuss selected draft chapters, design difficulties and composition problems.

HISC 299A - Thesis Research (5)

Prerequisite(s): advancement to candidacy.

HISC 299B - Thesis Research (10)

Prerequisite(s): advancement to candidacy.

HISC 299C - Thesis Research (15)

Prerequisite(s): advancement to candidacy.

HIS - HISTORY

Lower-Division

HIS 2A - The World to 1500 (5)

Surveys the rise of complex societies: the formation of classical civilizations in Afroeurasia and the Americas, post-classical empires and cross-cultural exchange, technology and environmental change, the Mongol Empire, and oceanic voyages and the origins of the modern world.

HIS 2B - The World Since 1500 (5)

Examines major world issues over the past 500 years. Topics include European expansion and colonialism, the Muslim empires, East Asia from Ming to Qing, the Americas, Africa, the scientific-technological revolution, decolonization, and modern environmental problems. Designed primarily for first- and second-year students, it provides a time frame for understanding events within a global framework.

HIS 4 - History of the Present: Investigating the Historical Origins of Contemporary Problems (5)

Explores how historical thinking can help you understand the developments, dilemmas, and crisis that are grabbing our attention in the present. It is organized around four themes: (un)natural disasters, the politics of representation, surveillance, and borders and belonging.

HIS 9 - Introduction to Native American History (5)

Introduction to the interdisciplinary field of Native American Studies and the Indigenous experience. Topics include: history of United States-Indian relations; colonialism; sovereignty; identity; representation of Native Americans in popular culture; and contemporary efforts toward decolonization in indigenous communities.

Offered: Spring.

HIS 9A - Native American History to 1860 (5)

Surveys the history of the indigenous peoples of North America until 1860. Introduces the diversity of Native American history and highlights the major themes of Native American history during this period.

HIS 10A - United States History to 1877 (5)

Focuses on the building of British American colonies and the establishment, disintegration, and reconstruction of the nation with an emphasis on how class, race, ethnicity, and gender impacted colonial development and structured the nation's agenda and the definition of citizenship.

HIS 10B - United States History, 1877 to 1977 (5)

Surveys the political, social, and cultural history of the United States from 1877 to 1977. Focuses on national politics with emphasis on how class, race, ethnicity, and gender changed the nation's agenda.

HIS 11A - Latin America: Colonial Period (5)

Introduces the social, cultural, economic, and political history of the New World through a close examination of the process of European conquest in the 16th century and its consequences for both native and settler peoples. Medieval and Renaissance European and African backgrounds; Inca, Maya, Aztec, plains, woodland, and tropical rainforest native American societies; processes of military and cultural conquest; epidemics and ecological changes; native resistance and the establishment of the fundamental institutions of colonial society.

HIS 11B - Latin America: National Period (5)

An introduction to the study of Latin American history from the Independence Wars in the early 19th century to the present. Topics include changing economic models of development, U.S. role, rural and urban life, women, nationalisms, populism, revolution, the military in politics, and the problem of democracy.

HIS 12 - Introduction to Latino American History (5)

Introduces students to the history of U.S. Latinos drawing on the experience of Central Americans, people of Mexican descent, Puerto Ricans, Dominican Americans, and Cuban Americans. Emphasizes international processes that fundamentally shape U.S. Latino communities.

HIS 13 - Introduction to American Religious Culture (5)

Introduction to the many communities found within the American religious landscape, balancing extraordinary diversity characterizing American pluralism against the dominant religious culture. Proceeds historically, engaging major problems and developments including utopianism, the rise of evangelicalism, religion and reform, manifest destiny, secularization and modernity, and the intersection of politics and religion.

HIS 15 - The United States of America from its Founding through Our Time (5)

Takes students through five critical moments in United States history: the American Revolution, the Civil War, the New Deal, the Civil Rights era, and the years following the attack on the United States on Sept. 11, 2001. Designed for non-majors.

HIS 20 - U.S. Popular Music Movements (5)

Focuses on the development of popular music genres in the United States and the social contexts that have produced them, from the 19th Century to the present. Promotes an understanding of how music influences and reflects our political lives.

HIS 30 - The Making of Modern Africa (5)

Examines the loss and reassumption of local and state autonomy in Africa during the 19th and 20th centuries. Delineates the modalities of the colonial state and society, modes of resistance to alien occupation, and the deformation of social, class, and gender relations.

HIS 40A - Early Modern East Asia (5)

Surveys the history of East Asia from 1500 to 1894. Covers political, social, economic, and cultural histories of China, Japan, and Korea with the goal of perceiving a regional history that encompassed each society.

HIS 40B - The Making of Modern East Asia (5)

A broad introductory survey of the political, social, economic, philosophical, and religious heritage of modern China, Japan, and Korea. Emphasis on the historical foundations of modern nationalism, the colonial experience, and revolutionary movements.

HIS 41 - The Making of the Modern Middle East (5)

History of the modern Middle East from 1800 to the present, with special reference to the 20th century and forces which have shaped the area. The impact of imperialism, nationalism, and revolution in the area, with particular attention to the history of four countries: Turkey, Iran, Egypt, Israel.

HIS 44 - Modern South Asia, 1500 to Present (5)

Provides an introductory survey of South Asian history and society from the beginning of the 16th Century until the dawn of the 21st Century. Students gain an understanding of major events and long transformations in society, economy, culture, and politics.

HIS 50 - When Pharaohs Reigned: The History of Ancient Egypt (5)

Introduces the political and social history of ancient Egyptian civilization from the Predynastic through the end of the Pharaonic period. (Formerly Pyramids and Papyrus: the History of Ancient Egypt.)

HIS 51 - Pyramids of Earth: Religion and Symbol in the Ancient World (5)

Investigates the use of the pyramid architectural form in ancient societies across the globe, including Egypt, Mesopotamia, the Americas, and Southeast Asia. The social, political, and religious motivation for building pyramids is explored.

HIS 58 - From Pirates to Refugees: The History of the Modern Mediterranean (5)

Covers the history of the Mediterranean from the end of the Ottoman Empire to the present. It focuses on the role of empire in shaping patterns of economic and cultural exchange.

HIS 59 - The History of the English Language (5)

Students acquire an understanding of the history of the development of the English language, from its origins to present, and engage critically with the quantitative evidence for that history, using accessible online databases and digital texts.

HIS 60 - Medical and Scientific Terminology (5)

Trains students in the principals that will help them make sense of Greco-Latin scientific and technical vocabulary. Introduces Greco-Roman natural philosophy and its general cultural

context, and explains the historical relationship of that tradition to the emergence of modern European experimental science and technology. (Formerly Scientific Vocabulary and the Roots of the European Scientific Tradition.)

HIS 61 - Classical Mythology (5)

Introduces the philosophy of myth, and surveys classical Greek mythology. Students explore the mythic mode of thinking and its distinguishing characteristics as well as the repertoire of Greek myths and their cultural contexts.

HIS 62A - Classical World: Greece (5)

An overview of Greek history from the beginnings through the Hellenistic period, with emphasis on the Archaic and Classical periods (ca. 800 B.C. through 323 B.C.).

HIS 62B - Classical World: Rome (5)

A lecture course offering an overview of Roman history and civilization from the legendary founding of Rome in 753 B.C. to the collapse of the Roman Empire's central administration in the West in 476 A.D.

HIS 70A - Modern European History, 1500-1815 (5)

Surveys the economic, social, cultural, and political history of Europe since the late 15th century: 1500-1815. Course 70A is not a prerequisite to course 70B.

HIS 70B - Modern European History, 1815-present (5)

Surveys the political, social, and cultural history of Europe from the era of the Industrial Revolution to the beginning of the second millennium. Course 70A is not prerequisite to 70B.

HIS 74 - Introduction to Jewish History and Cultures (5)

Surveys 3,000 years of Jewish history. Themes include origins of the Jews in the ancient world, formation and persistence of the Jewish diaspora, coherence and diversity of Jewish experience, Jewish narrative and textual traditions, interaction between Jews and other cultures, productive tensions between tradition and modernity in Jewish history and literature.

HIS 74A - Introduction to Middle Eastern and North African Jewish History: Ancient to Early Modern (5)

Popular media present Muslims and Jews as age-old enemies; this is far from the truth. Through primary sources, secondary texts, and films, students examine this fraught and politicized history, challenging conventional narratives of the region and its Jewish population.

HIS 74B - Introduction to Middle Eastern and North African Jewish History, 1500-2000 (5)

Surveys modern Jewish history from Morocco to Iran, 1500-2000. Studying these populations through original documents, scholarly works, and literature imparts a unique perspective on both modern Jewish history and that of the region, challenging and complementing standard narratives of each.

HIS 75 - Film and the Holocaust (5)

Examines a series of distinguished documentary and feature films about the destruction of European Jewry. Each film is placed in its historical context, and wherever possible, the readings include the original documents on which films were based. Emphasis is placed on the strategies the filmmakers used to address the problem of representing genocide without succumbing to mere melodrama.

HIS 76 - The Holocaust: A Global Perspective (5)

Investigates the genocide of the Jews from 1933 to 1945 within its broader historical context, including anti-Semitism, the Great Depression, Nazi-Soviet relations, and World War II. Examines how the Holocaust unfolded in Europe as well as its impact on Jews in North Africa and the Middle East. (Formerly The Holocaust.)

HIS 78 - Modern Authoritarianism in Europe and Beyond (5)

Examines modern authoritarianism and mass dictatorship as distinct political forms that promote and draw their strength from popular support and mobilization. Students study how non-democratic leaders are able to attain, exercise, perpetuate, and misuse their power.

HIS 80C - Global China (5)

Introductory and collaborative history course that examines the social dimensions of globalization through a focus on China since 1500. Asking how China shaped and was shaped by interactions with major world regions—Europe, the Americas, and Asia—course discusses how networks of trade, imperialism, revolutions, migration, popular culture, and capitalism created significant global conjunctures and interdependencies with lasting impact. In addition, course offers instruction on how to collaborate with others effectively to achieve common goals. Students apply knowledge and techniques learned to a series of group projects.

HIS 80D - Visualizing Modern East Asia (5)

Introduction to modern East Asian history, with a specific focus on the nations of China, Japan, and Korea. Students investigate major historical questions about modernity, imperialism, colonialism, nationalism, gender, and labor from the late 19th century to the late 20th century. This course is also designed to explore contemporary media, looking at how visual reproductions become instruments to remember the past. Through the exercise of visualizing East Asian history, the course aims to help students make critical assessments of mass media information on East Asia available to the American public.

HIS 80X - Civil Rights Movement: Grassroots Change and American Society (5)

The civil rights movement of the 1950s-60s was one of the most important grassroots social movements in American history. Course examines this movement and its effects on American society, focusing especially on the experiences of rank-and-file participants.

HIS 80Y - World War II Memories in the U.S. and Japan (5)

Examines how the meaning of such issues as war origins, war responsibility, the atomic bomb, reparations, and racism have been subjects of contention in postwar U.S. and Japan. Students explore the relations between history, memory, and contemporary politics.

HIS 81 - Science in the Colonial World (5)

Introduces students to the history of science in colonized lands. Covers topics such as natural history collecting, medicine, bodily experimentation, botanical gardens, healing plants, and agriculture. Students learn about local colonial scientific production and anti-colonial resistance by focusing on case studies from Southeast Asia, with supplemental readings on colonial Caribbean, Latin American, and North African sites, as well as present-day North American indigenous territories. Students also investigate the possibilities for decolonizing science itself.

HIS 82 - California Gold Rush in Global History (5)

Course seeks to reframe a paradigmatic event in the history of California and the United States as an event in global history. Rather than assume the spatial and temporal boundaries of the Gold Rush, students explore different possible answers to the questions of where and when the Gold Rush happened, why it matters, and for whom. Students retrace connections and make comparisons between events in California and other places that often fall beyond the purview of "California History" as conventionally understood. (Formerly Global History of the California Gold Rush.)

HIS 99 - Tutorial (5)

Students submit petition to sponsoring agency.

Upper-Division**HIS 100 - Historical Skills and Methods (5)**

Designed to introduce history majors to historical methods and provide preparation for exit seminars. Students develop critical reading, historical analysis, research, and disciplinary writing skills.

Prerequisite: Enrollment is restricted to history majors and proposed majors or by permission of the instructor.

HIS 101C - Oceans in World History (5)

Oceans, human communities, and the variety of relations between societies have been linked closely in world history. This course focuses on the three most well-researched and, historically, most important oceanic worlds--those that developed to link the regions bordering the Mediterranean Sea, Indian Ocean, and Atlantic Ocean.

HIS 101D - World History of Science (5)

Human curiosity and inquiry changed and varied widely across Eurasia. This course surveys how the curiosity and inquiry were framed in three major civilizations (China, Islam and Judeo-Christian) from the Mongol conquest of Eurasia in the 13th

century to the beginning of industrial capitalism in the 19th century.

Prerequisite: Enrollment is restricted to sophomores, juniors, and seniors.

HIS 101E - Global 1930s (5)

Explores the turbulent 1930s from a global perspective. Students consider the great events of the decade--the Great Depression, the consolidation of communism, and the rise of fascism--within the context of global connections and forces, including those fostered by imperialism and various forms of internationalism. (Formerly course 196A.)

HIS 101F - Global Environmental History (5)

Provides overview of global environmental history from prehistoric times to the present. Explores how Homo Sapiens became the dominant species on the planet, how some of them managed to grow food and domesticate animals, and how these agrarian or nomadic societies developed states or even empires. Explores what many have called the Anthropocene Epoch in the evolution of Earth.

Prerequisite: Enrollment is restricted to sophomores, juniors, and seniors.

HIS 104C - Celluloid Natives: American Indian History on Film (5)

Examines how American Indian history and culture has been portrayed in Hollywood films, with an emphasis on films that represent Native Americans over the broad spectrum of Native American/white relations.

HIS 104D - Museums and the Representation of Native American History, Memory, and Culture (5)

Provides an historical overview of the relationship between American Indians and museums. Current issues and practices in museums are explored, primarily those associated with ethics, collecting practices, exhibitions, education/interpretation, and administration/governance.

HIS 105 - Nations and Nationalism (5)

Provides an historical, comparative, and theoretical exploration of the development of nations and nationalism. Emphases include the historical formation of nation-states, modernization, colonialism, decolonization, nations and globalization, and the intersections between ethnicity, race, religions, and nationalism.

HIS 106A - Vietnam War Memories (5)

Compares memories and interpretations of war in Southeast Asia by diverse groups in France, America, and Vietnam. Topics include war origins, military strategies, propaganda, combat, civilians, media, activism, MIAs, refugees, mixed race children, memorials, textbooks, films, music, literature, and art.

HIS 106B - Asian and Asian American History, 1941-Present (5)

Analyzes immigration, race relations, war, gender ideology, family life, acculturation, political activism, interracial marriage, multiracial identity, and cultural representations

between 1941 and the present. Emphasis on discussion, writing, research, and group presentations.

HIS 109A - Race, Gender, and Power in the Antebellum South (5)

Examines how ideologies of race and gender shaped the development of slavery and empire in the American South from European colonization to the eve of the American Civil War.

HIS 110A - Colonial America, 1500-1750 (5)

Explores the social, economic, cultural, and political development of British North America from the first European/Amerindian contacts in the late 16th century through the establishment of a provincial British colonial society. Course 110A is not a prerequisite to course 110B.

HIS 110B - Revolutionary America, 1740-1815 (5)

Explores the political, social, economic, and cultural development of British North America from the first stirrings of resistance to the establishment of the U.S. Course 110A is not a prerequisite to course 110B.

HIS 110D - The Civil War Era (5)

Social, political, and economic history of the American Civil War and Reconstruction, focusing on the war's changing nature and significance, emancipation, and the postwar struggle over the future of the South and the nation.

HIS 110E - Rise of the Machines: Technology, Inequality, and the United States, 1877 to 1914 (5)

History of the U.S. during what was perhaps its most socially turbulent era, the period following Reconstruction through the First World War. What did it mean to be a nation in the post-Reconstruction era? How did a country that had only recently unified itself under one system of labor now resolve the question of national identity? Was America truly a nation by 1914?

HIS 110F - World War USA: The United States from 1914 through 1945 (5)

Between the First and Second World Wars, American society accepted the need for a regulatory state to save capitalism from itself. Takes an in-depth look at many aspects of U.S. politics and culture during these years.

HIS 110G - Strange Days: The USA and its National Security State, 1945-1991 (5)

From the Good War to the Cold War, the Sixties to the rise of the New Right, the post-1945 American experience has been one of extremes. This survey course looks for evidence of commonality during those times. (Formerly Age of Extremes: The United States During the Cold War, 1945 to 1991)

HIS 110H - Greater Reconstruction: Race, Empire, and Citizenship in the Post-Civil War United States (5)

Examines how the consolidation of United States sovereignty in North America and the establishment of an overseas empire during the period between the conclusion of the Civil War and

the Phillippine-American War reshaped conceptions of race and citizenship.

HIS 112 - American Feminist Thought, 1750-1950 (5)

Traces history of feminist thought in the United States from the 18th century Enlightenment to the mid-20th century. Focusing on questions of social identity, gender difference, and legal/political status, examines writings of philosophers, activists, novelists, and ordinary women that challenged religious, political, and scientific beliefs underlying gender inequality.

HIS 113C - Women and American Religious Culture (5)

Historical introduction to religious culture of U.S. as experienced and created by women. Explores religious ideas about women, the treatment of women by mainstream institutions and religio-social communities, and female religious leaders and followers. Takes an explicitly feminist analytical approach and uses a variety of texts, including historical and literary scholarship, sacred texts, fiction, autobiography, material artifacts, visual art, and music.

HIS 114 - Market Revolution in Antebellum U.S. (5)

Examines the cultural, political, and environmental upheaval associated with antebellum market revolution. Topics include: markets and U.S. territorial expansion; reform movements that coalesced around disputes over what should, and should not be sold (e.g., antislavery activism; anti-prostitution reform movements).

HIS 116 - Slavery Across the Americas (5)

Examines the exploitation of African people as slaves throughout European colonies in the Americas. How did slavery affect slaves, enslavers, and their societies? Emphasizes the diversity of slave regimes and their importance for shaping American life for all.

HIS 116A - Unchained Memory: Slavery and the Politics of the Past (5)

Investigates the representation of slavery with scholarly and vernacular histories, focusing on the United States. Students examine representations of slavery in scholarly works, public-history venues like museums and historic sites, popular culture, and artistic productions. Students develop their own scholarly research into the history of slavery grounded in primary and secondary sources.

HIS 117 - Wired Nation: Broadcasting & Telecommunications in the US from the Telegraph to the Internet (5)

Explores the history of telecommunications systems in the US starting with the telegraph, the telephone, wireless telegraph, radio, television and the Internet. Students learn about the development of these systems and the cultures that they foster.

HIS 117A - From the Player Piano to Pandora (5)

Explores the history, culture, and politics of the distribution of recorded and live sound from the 1870s through the present.

HIS 118 - The Global Cold War, 1945-1991 (5)

Explores the history of the Cold War from a global, multinational perspective. Begins with the opening salvos between the United States and the Soviet Union in 1945, and concludes with the collapse of the latter empire in 1991.

HIS 118A - Conspiracy Planet: How Conspiracies, Conspiracy Theories, and Conspiracy Scandals Shape History (5)

Explores the history of a principal obsession of our age: the conspiracy. Focuses on the people who love them most: conspiracy theorists. Millions of people around the world believe in conspiracy theories. Why?

HIS 120 - W.E.B. Du Bois (5)

Examines the thought and activities of W.E.B. Du Bois across changing historical circumstances. Considers the ways Du Bois's work has been used in the present to address issues such as racism and imperialism.

HIS 121A - African American History to 1877 (5)

A survey of pre-contact Africa, indigenous social structures, class relations, the encounter with Europe, forced migration, seasoning, resistance, Africa's gift to America, slavery and its opponents, industrialization, emigration vs. assimilation, stratification, Convention Movement, Black feminism, Civil War, and Reconstruction.

HIS 121B - African American History: 1877 to the Present (5)

A survey of the period from 1877 to present, highlighting Jim Crow, Militarism, Black feminism, WWI, New Negro, Garveyism, Harlem Renaissance, Black Radicalism, Pan Africanism, Depression, WWII, Desegregation Movement, Black Power, 1960s, Reaganism. Cultural and economic emphases.

HIS 122A - Jazz and United States Cultural History, 1900-1945 (5)

Explores the meaning of jazz in United States society and as a U.S.-based art form in other societies. Examines the social and cultural forces that have produced different jazz styles and the various ways that social conflicts and ideals have been displaced onto the music.

HIS 122B - Jazz and United States Cultural History, 1945 to the Present (5)

Explores the meaning of jazz in United States society and as a U.S.-based art form in other societies since 1945. Examines the social and cultural forces producing jazz movements and the social transformations, conflicts, and ideals read into the music.

HIS 123 - Immigrants and Immigration in U.S. History (5)

Introduces U.S. immigration history from the colonial era to the present, with emphasis on the recent past. Particular attention given to changing immigration patterns; the character of the immigrant experience; and the range of responses to immigration, including nativism.

HIS 124A - Panama Canal and U.S. Empire (5)

Explores the technological, environmental, social, political, and diplomatic history of a critical link in global transportation networks: the Panama Canal. The Canal has long been celebrated as one of the great triumphs in the history of technology and engineering. But this triumphalism obscures a more complicated history of struggle over issues including land, water, health, race, citizenship, and sovereignty. Course explores the Panama Canal's fraught history from the construction years of 1904-1914 through the restoration of full control to Panama in 1999.

HIS 128 - Chicana/Chicano History (5)

A survey course on the social history of the Mexican (Chicana/o) community and people in the U.S. through the 20th century. Themes include resistance, migration, labor, urbanization, culture and politics.

HIS 130 - History of Modern Cuba (5)

Covers from the Cuban sugar revolution (late 18th century) to the socialist revolution and its aftermath (1959–present). It is intended to be not only a modern history of Cuba but also a broader history of Latin America through the case of Cuba.

HIS 131 - Women in Colonial Latin America (5)

Introduction to the social history of Latin America through a focus on the inflections of class and ethnicity on gender in this region. First six weeks focuses on the colonial period. The last three weeks covers the 19th and 20th centuries.

HIS 134A - Colonial Mexico (5)

Covers the social, cultural, economic, and political history of colonial Mexico (New Spain). Special attention paid to colonial identity formation, religion, and labor systems. Begins by examining indigenous societies prior to the arrival of Europeans and concludes with Mexico's independence movement in the early 19th century.

HIS 134B - History of Mexico, 1850 to Present (5)

Social, cultural, economic, and political history from the triumph of Liberalism to the present day, focusing on four key periods: the dictatorship of Porfirio Diaz (1900–1910), the armed phase of the Revolution (1910–1920), the consolidation of revolutionary programs and a single-party democracy (1920–1940), and the developmentalist counter-revolution since 1940. Provides background for understanding the Mexican diaspora to the U.S.

HIS 137A - Africa to 1800 (5)

Introduction to history of Africa. Topics include states and stateless societies, culture, society and economy in the pre-modern era, stratification, oral traditions, long distance trade, the coming of Islam, and the evolution of the South Atlantic system and its social, political, and other consequences. Some background knowledge of Africa helpful.

HIS 137B - Africa from 1800 to the Present (5)

How Africa lost its continental, regional, and local autonomy in the era of European imperialism. The components of European hegemony, Christian proselytization, comparative colonial strategies and structures, nationalism, decolonization and independence and the disengagement from neo-colonial patterns and the colonial legacy. Case studies from northern and sub-Saharan Africa. Some background knowledge of Africa helpful.

HIS 137C - African Cinema (5)

Historical study of modern African cinematography from the emergence of film as a tool of social control in the imperial and colonial periods to its theoretical and practical transformation by African cineastes in the post-independence era. Films and videos from northern, eastern, western, central/equatorial, and southern Africa viewed.

Prerequisite: Prerequisite(s): HIS 30 or HIS 137A or HIS 137B, or by permission of instructor.

HIS 139C - Queer Pasts: A Radical Telling of LGBTQ History in the United States (5)

Critically explores how to preserve, represent, and study the history of queer and gender non-conforming people. Focuses on non-traditional and digital archives, oral history, and original research.

HIS 140B - History of Qing China, 1644-1911 (5)

Introduces students to how Qing China arose, expanded, and struggled to enter the modern world. Focuses on what the Qing empire had in common with other agrarian empires across Eurasia, commercialization and communication networks, elite mobility and peasant revolts, political legitimacy of the alien rule, maintaining social order (such as merchants' control and gender segregation), massive population growth and internal migration, as well as its conflicts with the industrial West.

HIS 140C - Revolutionary China 1895-1960 (5)

Explores history of China from the late 19th century to the early years of the People's Republic, focusing on the end of imperial rule, the sources and development of revolution, and early attempts at socialist transformation.

HIS 140D - Recent Chinese History (5)

Explores history of China from establishment of the People's Republic of China to the present, focusing on competing strategies of socialist transformation, urban/rural relations, and the effects of the post-Mao economic reforms.

HIS 140E - Women in China's Long 20th Century (5)

Introduces changes in Chinese women's lives--and changes in shared social ideas about what women should do and be--from the mid-19th century to the present. When we foreground gender as a category of analysis, how does history look different?

HIS 142 - History of Hong Kong and Taiwan: Two Peripheries of

China (5)

Studies the history of two peripheries of China, Hong Kong and Taiwan, from the earliest written records to the present. These two places were at various times part of China, and, to some, are still parts of China. However, these two have historical trajectories distinct from China and have developed their unique positions in the world. This course invites students to think about Taiwan and Hong Kong, not only their local histories and development, but also their role as two peripheries of China in Chinese nationalism and in U.S-China relations.

HIS 143B - History of the Philippines, 1815 to the Present (5)

Examines Philippine history from the early 19th century through the present. Though the course timeline begins in the Spanish colonial period, the class interrogates understandings of the pre-colonial past and how these have informed Philippine nationalism, intellectual history, social sciences, and more. Students learn about debates in the field and become familiar with scholarship from the Philippines. Students also reflect on the political urgency of the contemporary moment and how transnational flows of migrants, activism, and cultural production have changed dominant approaches to historical studies on the archipelago.

HIS 145 - Gender, Colonialism, and Third-World Feminisms (5)

Introduces the history of feminism in the third world, focusing on the ways in which colonialism (and post-colonialism) has shaped gender relations and on the feminist movements that have emerged in response to the impact of colonialism.

HIS 146A - Colonial South Asia 1750-1947 (5)

Introduces key transformations--political, economic, social, and cultural--in colonial Indian history. The focus is on the processes, institutions, and ideas that shaped colonial power and resisted it.

HIS 147A - History of Premodern India (5)

A study of religions (Vaisnavism, Tantrism, Islam, Sikhism), art, literature, and social movements in their historical contexts from 1000 A.D. to 1800.

HIS 147B - Political and Social History of Modern South Asia (5)

Social, political, and religious movements in the colonial and postcolonial contexts of the 19th and 20th centuries in modern and contemporary South Asia.

HIS 147C - South Asia in the 20th Century (5)

Introduces historical change in 20th-century South Asia. Topics include: modernity, gender, state formation, nationalism, democracy, and development. Course material includes interdisciplinary secondary works, primary reading by important political actors, and films. Prior knowledge of South Asia is useful, but not necessary.

HIS 147D - Intellectual History of South Asia (5)

Highlights the power of ideas in making South Asia modern. Focuses on the 19th and 20th Centuries. Ideas assessed include

liberalism, Marxism, Hindu revivalism, Islamic jihad, democracy, nationalism, secularism, and development.

HIS 149 - Plants, People, and the Making of Modern Southeast Asia (5)

Analyzes the entangled history of plants and people in Southeast Asia. Provides a broad sweep of the early modern period (pre-1500), imperial contact, anti-colonialism, nationalism, and decolonization up to present-day social and political conditions. The class examines plants of agricultural and medicinal value, political importance and ritual meaning. Students also consider how plants can be historical agents that shape and influence interaction in the region. Students likewise learn about the emergence of Southeast Asia as a field of study in the United States and debate the intellectual legitimacy of area studies, particularly through the optic of plant life.

HIS 150A - Emperors and Outcasts: Ancient Japan (5)

Surveys the history of the peoples of the Japanese islands from prehistorical migrations through the 15th century. Emphases include examination of social structures, political formations, cultural production, and religion. (Formerly Ancient Japan.)

HIS 150B - Tokugawa Japan (5)

Surveys the history of the peoples of the Japanese islands from the middle of the 15th century to the middle of the 19th century. Focus is on the era of civil war, the formation of the early modern federated state, social structure, and cultural production.

HIS 150C - Inventing Modern Japan: The State and the People (5)

Surveys the history of the peoples of the modern Japanese nation from the Meiji Restoration to the present. Focuses on the formation of the modern state, empire, social movements, and cultural production. (Formerly Modern Japan.)

HIS 150D - The Japanese Empire, 1868-1945 (5)

Examines the history of the Japanese colonial empire from 1868 to 1945, including the colonies of Taiwan, Korea, Micronesia, and Manchuria. Considers how the colonies were ruled and what the legacies of the empire have been.

HIS 150E - History and Memory in the Okinawan Islands (5)

Known historically as the Ryukyu Islands, Okinawa has long been an important transmitter of people, ideas, and goods in East Asia. Course explores this history by focusing not only on the royalty of these islands, but also on the lives of everyday people.

HIS 150F - Engendering Empires: Women in Modern Japan and Korea (5)

Explores how women's experiences in Japan and Korea were intertwined and differentiated before and during World War II under Japanese empire, and from the postwar to the present under American hegemony.

HIS 151 - History of Science, Medicine, and Technology from

Antiquity to the Enlightenment (5)

Questions explored include the debate over when/where modern science began; the role of craft-based and artisanal skills in the production of knowledge; and the technological and social impacts of intellectual change, from the Bronze Age to the birth of computing.

HIS 151A - Medicine and the Body in the Colonial World (5)

Explores the histories of bodies and medicine in the colonial world. Charts the relationships among ideas about the body, medical practice, race, and labor in the colonial world between the 16th and the mid-20th centuries

HIS 151B - Drugs in World History (5)

What were drugs in the early modern world? Who grew and consumed them? How were they used, and why? Students study how humanity's ancient fascination with altered states shaped globalization, the Scientific Revolution, the Atlantic slave trade, colonialism, and modernity itself.

HIS 154 - Post-Colonial North Africa (5)

Introduces the history of modern North Africa from WWI to the so-called Arab Spring. Topics include the dynamics of colonial rule and reform, anti-colonial nationalism, decolonization, the rise of Islamism, and popular protest.

HIS 155 - History of Modern Israel (5)

The conflict between Israelis and Palestinians is one of the most intractable disputes in our troubled world. Course begins with a glimpse of Palestine in the late 19th and early 20th centuries, surveys the rise and fall of utopian Zionism, pays especially close attention to the events of 1948 and 1967, and concludes by analyzing the collapse of hopes for peace after Oslo and Camp David meetings.

HIS 156 - Interrogating Politics in the Post-Colonial Middle East (5)

Explores the political trajectory of the post-colonial Middle East. Topics include: the Cold War and rise of Third Worldism; women's movements; political Islam; Arab-Israeli conflict; Lebanese Civil War; impact of oil production; Iranian Revolution; rise of the Arabian Gulf.

HIS 156A - Art, Culture, and Mass Media in the Arab Middle East (5)

Chronicles the cultural history of the Arabic-speaking regions of the Middle East through art, literature, cinema, and mass media during the 20th and 21st Centuries.

HIS 156B - Modern Arab Thought (5)

Studies the intellectual history of the Arab world from the nineteenth century to the Arab Spring. Beginning with Arab responses to colonialism, it covers the evolution of various schools of thought including liberalism, Islamism, Marxism, nationalism, and feminism.

HIS 157 - The Ottoman Empire (5)

Explores the history of the Ottoman Empire with emphasis on its Arabic-speaking provinces. In addition to critically considering the political trajectory of the empire, we interrogate a wide range of topics relating to community organization, economic networks, international affairs, and the significance of religion within the Ottoman realm.

HIS 158A - The Escapes of David George: Biographical Research on Slavery and Early America (5)

Invites student collaboration on a biography of David George, born enslaved in colonial Virginia. His attempts to escape slavery led to a remarkable odyssey throughout the Atlantic World, revealing the constraints of slavery and limits of American freedom. (Formerly COWL 161C.)

Prerequisite: Enrollment is restricted to College Scholars.

HIS 158C - Slavery in the Atlantic World: Historical and Archaeological Perspectives (5)

Explores the African diaspora resulting from the transatlantic slave trade, drawing on methodologies from two academic disciplines--history and archaeology. Examines key questions about the slave system, using an array of source materials, both written documents and artifacts.

Prerequisite: Enrollment is restricted to history, anthropology, and critical race and ethnic studies majors and minors and black studies minors or by permission of instructor.

HIS 159A - Cleopatra to Constantine: Greek and Roman Egypt (5)

Examines the political, social, religious, and material culture of ancient Egypt during these periods of intense interaction with the ancient Near East and Mediterranean, from the period of Alexander (332 BCE) through the beginning of Coptic Christianity (3rd century CE).

HIS 159B - Women and Gender in Ancient Egypt (5)

Explores sex and gender in ancient Egypt with a specific focus on women. Artistic representations, texts, objects of daily life, and burials are used to examine the practices that encoded gender in this ancient culture.

HIS 159C - Temple and City: The Egyptian New Kingdom and the City of Thebes (5)

Introduces the political and religious history of the Egyptian New Kingdom (1546-1086 BCE), using the city of Thebes as a focal point. The political, religious, and architectural history of the city is covered.

HIS 159D - When Cities Were New: the Rise of Urbanism in the Ancient Near East and Mediterranean (5)

Investigates the rise and development of urbanism in the ancient Near East and Mediterranean world, including Mesopotamia, Syria, Egypt, Greece, and the Roman Empire. Close studies of individual ancient cities, as well as broader issues in ancient urbanism are covered.

HIS 160A - Athenian Democracy (5)

Athenian democracy from foundation to the fourth century B.C., with emphasis on its practices and ideologies. Readings from ancient sources and modern theory. Topics to include foundations and development; Athenian concepts of freedom, equality, law, citizenship. Lectures and discussion.

HIS 160C - Topics in Greek History (5)

Detailed consideration of some specific topic or period in Greek history, varying from year to year. Examples include Greek religion, Alexander, the Hellenistic world, the ancient Greek economy, and Greece and India; Thucydides and the Peloponnesian War; Greek art and archaeology.

HIS 161B - Topics in Roman History (5)

Detailed consideration of some specific topic or period in Roman history, varying from year to year. Examples include Roman religion, Augustus and the Roman Empire, Julio-Claudian emperors and the principate, Roman slavery, and Christianity and Rome.

HIS 163B - Genesis: A History (5)

Introduction to historical, textual, source, and redaction criticism of the book of Genesis and to exegesis as science and ideology. Texts, history, and iconography of neighboring traditions (Mesopotamian, Ugaritic, Egyptian, Greek) are also studied when appropriate.

HIS 164A - Late-Medieval Italy, c. 1200-1400 (5)

Italy from the birth of the commune to the early Renaissance in Florence. Topics include urban life and social conflict, gender roles, St. Francis, the Black Death, female mystics, Dante, Boccaccio, humanism, artistic developments from Giotto through Donatello. Requires viewing several films outside of class.

HIS 164B - Renaissance Italy, c. 1400-1600 (5)

Italy from the Florentine Renaissance through the Reformation. Topics include social change and political consolidation, the rise of the papacy, court life, witch hunting, Machiavelli, artistic developments from Donatello through late Venetian Renaissance. Requires viewing several films outside of class. HIS 164A recommended as preparation.

HIS 165A - Medieval History and Architecture (5)

Covers the history and architecture of Europe and the Mediterranean from Late Antiquity through the fall of Constantinople in 1453. Beginning with Constantine and the rise of Christianity, this course follows the development and spread of new cultures and architectural forms, stretching from Islamic material in the east to the British Isles in the west. Course stresses the evolution of architecture during the medieval period as well as the cross-cultural influences that affected their form and what this can tell us about the cultures that created them.

HIS 166 - Northern Ireland: Communities in Conflict (5)

Introduction to the so-called troubles in Northern Ireland, from the 1960s to the present. Examination of the historical background to the conflict, the patterns of conflict in the 1970s and 1980s, and the emergence of a peace process in the 1990s.

HIS 167A - The First World War (5)

An intensive analysis of the First World War from multiple perspectives: military, diplomatic, political, economic, technological, global, and cultural. The emphasis is on the transformative impact of the war on European societies, international relations, and modern culture.

HIS 167B - The Second World War in Europe (5)

Making use of multiple perspectives, this course explores the origins of the Second World War, its course and outcome, and its transformative effects on European society, culture, politics, and demographics. Closely examines the war's impact on diverse civilian populations.

HIS 169 - Dutch and Belgian History, 1500 to Present (5)

The political, social, economic, and cultural history of the modern Netherlands and Belgium from 1500 to the present day.

HIS 170A - French History: Old Regime and Revolution (5)

French history from the Middle Ages through the Revolution. Focus on the rise and fall of absolute monarchy, the nature of Old Regime society, the causes and significance of the French Revolution. Attention to those who endured as well as to those who made events.

HIS 170B - French History: The 19th Century (5)

Social, political, and cultural history of France from the Revolution to WWI. Focus on the Revolutionary tradition, the Napoleonic myth, the transformation of Paris, and the integration of the peasantry into the national community. Readings may include novels by Stendhal and Balzac.

HIS 170C - From the Trenches to the Casbah: France and its Empire in the 20th Century (5)

Surveys major events in 20th-century French history, such as the two World Wars, the Thirty Glorious Years, European integration, decolonization, the Cold War, and the events of May 1968.

HIS 172A - German History (5)

The development of German civilization, including philosophy and literature as well as politics and diplomacy in the 19th and 20th centuries.

HIS 172B - German Film, 1919-1945 (5)

Introduction to German films from 1919 to 1945. Through combination of movies and documentaries, gain insight into political, economic, social, and cultural conditions of Weimar and Nazi Germany.

HIS 172C - History of German Film, 1945 to Present (5)

Uses films and documentaries to provide insight into the political, social, economic, and cultural conditions of postwar East and West Germany, with a strong focus on remembrance of the country's Nazi past.

HIS 174 - Spies: History and Culture of Espionage (5)

Analyzes the roles of espionage and intelligence in modern European history with emphasis on major conflicts from the Franco-Prussian War through the Cold War and beyond. Also examines images of spies in popular culture from the early 20th century to the present.

HIS 176 - Eastern Europe, 1848-2000 (5)

Examines the political and social history of modern Eastern Europe, excluding the Balkans and Baltic States, from 1848 to the present. Focuses on the development of nationalism, war, occupation, ethnic strife, communism, and democratic reform in this region.

HIS 177A - Slaves, Soldiers, and Scientists: History of the Tropics (5)

Surveys the role of the tropics and tropical peoples in history, covering the post-Columbian encounters between indigenous Americans, Europeans, and Africans, colonialism, and the origins of fields, such as anthropology and tropical medicine. (Formerly Tropics of Empire.)

HIS 178A - European Intellectual History: The Enlightenment (5)

Study of European thought and literature from Hobbes and Swift to Rousseau and Goethe. Focuses on relation of ideas to their social and cultural context. Special attention to traditions of religious conflict and criticism rising from the Protestant Reformation; to the discovery of the world beyond Europe; and to the intellectual and cultural roots of the French Revolution.

HIS 178B - European Intellectual History: The 19th Century (5)

Study of European thought and literature from Blake to Nietzsche. Focuses on relation of ideas to their social and cultural context. Special attention to the rise and fall of the Romantic movement, to changing conceptions of history, and to the development of socialist and aesthetic critiques of industrial civilization.

HIS 178C - European Intellectual History, 1870-1970 (5)

Drawing on experiments in autobiography, the arts, and social theory, this course focuses on ideas and images of modernity in European culture. It also highlights the role of the intellectual as politically engaged or disillusioned witness in a violent century.

HIS 178E - Modern Jewish Intellectual History (5)

Surveys European Jewish intellectual history from the Enlightenment to the present. Major themes include emancipation and assimilation, the flowering of Yiddish literature, the rise of Zionism, new variations on the messianic idea, and Jewish contributions to the culture of urban modernism.

HIS 181 - Modern Britain and the British Empire (5)

Examines the history of the British Isles and the British Empire from the late 17th century to the present. Traces the expansion, transformation, and dissolution of the British Empire as well as the changing meanings of Englishness and Britishness over this period.

HIS 181B - Africa and Britain in an Imperial World (5)

Covers the long history of interaction between Britain and Africa, from the Atlantic slave trade and British colonialism in Africa up to the post-colonial present, from British settlers in Africa to the African presence in the British Isles.

HIS 183A - Nineteenth-Century Italy (5)

Italian politics, culture, and society from the Napoleonic era through early leftist movements. Central emphasis on the Risorgimento and Unification. Other topics include: north-south conflict; banditry; urban change; growth of tourism; popular religion; family structures and gender; visual arts and opera.

HIS 183B - Fascism and Resistance in Italy (5)

Examines Italian politics, society, and culture (c. 1900-1950), emphasizing the Fascist regime; interdisciplinary focus emphasizing history, literature, and film. HIS 183A recommended as preparation.

HIS 184B - Racism and Antiracism in Europe: From 1870 to the Present (5)

Explores the histories of racism and anti-Semitism alongside efforts to combat racism in Europe from 1870 to the present. Offers a conceptual basis for thinking about the definition of race and its historical evolution.

HIS 185C - Communism, Nationalism, and Zionism: Comparative Radical Jewish Politics (5)

Comparative in approach, course examines Jewish radical politics across Europe, North Africa, the Middle East, and the Americas in the late 19th and 20th centuries. How did radical politics afford Jews greater agency in contexts that otherwise excluded them? What tensions arose with religious, nationalist, and internationalist obligations? What drew so many Jews across so many diverse contexts to focus on radical leftist politics? What, if anything, links Jews and radical politics across such diverse contexts? Through primary sources, memoirs, scholarly works, films and more, students compare Jewish engagement in radical leftist movements in several nodes, including Russia (and the former USSR), Poland, France, Egypt, Iraq, Morocco, Israel, Argentina, Mexico, and the USA among others.

HIS 185I - Latin American Jewish History in the Modern Period (5)

Explores Jewish immigration settlement and identity negotiation in Latin America from the mid-19th Century to the present.

HIS 185J - The Modern Jewish Experience (5)

Historical comparative overview of the political, socio-cultural, and intellectual transformation of Jewish societies in Europe and the Middle East from the late 18th Century to the present.

HIS 185K - Jewish Life in Eastern Mediterranean Port Cities (5)

Overview of the Jewish experience in important cities in the age of empire. Istanbul, Beirut, Alexandria, and Salonica were home to thriving, culturally diverse Jewish populations. Course explores these urban Jewish cultures, the institutions, and intellectual production.

HIS 185L - Where Civilizations Met--Jews, Judaism, and the Iberian Peninsula (5)

Surveys Jewish life in the Iberian Peninsula from Roman times to the present, and explores offshoot Hispanic Jewish societies in the aftermath of the 1492 expulsion.

HIS 185M - Zionism: An Intellectual History (5)

Zionism is one of the most complex--and contested--political and ideological movements of the modern period. This course explores the intellectual history of Zionism and its critics, from the late 19th century to the establishment of the State of Israel.

HIS 185O - The Holocaust and the Arab World (5)

Examines World War II in North Africa and the Middle East. Through primary and secondary sources, films, and novels, students consider WWII and the Holocaust as they intersect with colonial and Jewish histories in the Arab world.

HIS 189 - @history: Doing History in a Digital Age (5)

Investigates questions relating to how new technologies are changing the way historians do research and interact with the public. This course has both a critical classroom component and a hands-on computer laboratory component.

Prerequisite: Enrollment is restricted to junior and senior history, Jewish studies, German studies, and classical studies majors.

HIS 190A - Slavery and Race in Latin America (5)

Covers comparative history of slavery in Latin America with questions of race in the colonial and national periods and key moments and debates in the historiography of slavery and its relation to ideologies of the past and the nations.

Prerequisite: Prerequisite(s): Satisfaction of the Entry Level Writing and Composition requirements, HIS 100, and two additional upper-division history courses, or by permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 190B - Race and the Nation in Latin America (5)

Focuses on the ways in which nation and race have been thought about in Latin America throughout the 19th and 20th centuries. These concepts were closely intertwined, albeit in differing and changing ways, since the wars of independence from Spain and Portugal (1810-1825). Compares the ways in

which black, Indian, and racially mixed (mulatto or mestizo) have been socially constructed, ideologized, and contended in different countries, including Brazil, the Spanish-speaking Caribbean, Mexico, Peru, and Argentina.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100 and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 190D - Asian and Latino Immigration Since 1875 (5)

Examines Asian and Latino immigration into the United States since 1875. Students explore the relationship between U.S. foreign policies and immigration policies, transnational ties and homeland connections, and the cultural and political influences they have on American society.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100, and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 190E - Topics in Chicana/o History (5)

A seminar on the history of Chicanos/Mexicans in the United States, 1848 to the present. Topics include Chicana/o labor, family, social, urban, cultural, and political history.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100, and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 190F - Research Seminar in the Americas (5)

Students learn how to conduct research and write history. Primary and secondary sources are extensively read. Research sources include a rich array of government documents, newspapers, memories and diaries, visual material and film.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100, and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 190H - History of Time (5)

Writing-intensive seminar on the experience, manipulation, and representation of time in history. Students pursue advanced research using primary and secondary sources.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100, and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 190J - Mexican History in the Archives (5)

Explores the history of early Mexico (the Colonial Era through the mid-19th century) through original archival research.

Includes field trips to regional archives and research libraries. Reading knowledge of Spanish is recommended.

Prerequisite: Prerequisite(s): Satisfaction of the Entry Level Writing and Composition requirements, HIS 100, and two additional upper-division history courses, or by permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 190K - Wired Planet: Readings on the Global History of Broadcasting and Telecommunications (5)

Locates common themes in the history of broadcasting and telecommunications throughout the world. Why do certain strategies for developing broadcasting and telecommunications systems succeed or fail? Why do some nations outstrip other nations of comparable development in the growth of their communications systems? Why do national or regional communication systems suddenly become more or less open, or more or less centralized?

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100, and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 190L - Personal Politics in the New South (5)

Examines the tensions between movements for political reform and reaction in the southern United States between Reconstruction and the second world war. Students develop a research paper grounded in primary research that addresses these questions.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100, and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 190M - History of Children and Culture of Childhood in the 19th Century (5)

Explores the lives of children and the functions of the literary figure of the child in the cultural politics of the 19th century in the United States. Examines the historically contingent nature of childhood through historical, literary, and visual sources.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100, and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 190N - Topics in African History (5)

Examines contemporary crises in Africa: the new South Africa, refugees, HIV/AIDS, children of war, blood or conflict diamonds, civil war, and genocide in Rwanda. Seminar format where students will be prepared to undertake studies on specific subjects and two rounds of 15–20 page papers.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100, and two

additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 190O - African American Historiography (5)

Major themes in contemporary African American historiography on a topical basis.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100, and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 190P - Early American Society and Culture (5)

Explores subjects and themes in the political, social, and cultural history of early U.S. history from the colonial period through 1850. Includes critical reading of current scholarship and research in primary texts. The focus of this course is the production of a 25-page research paper. Recommended for senior history majors.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100, and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 190Q - The Novel and History (5)

Explores novels and novelists in relation to the writing of historical scholarship. Breaking down the simplistic genre division between fiction and nonfiction, provides opportunities for students to read novels as historical evidence, novels as editorial commentary, and novels as analytical narrative. Students produce a series of papers that culminate in a 25-page research project.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100, and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 190R - Research in the History of American Religions (5)

Readings and research in the history of religions in the United States. Readings focus on topics including the rise of evangelicalism; gender and religion; class, race, and religious diversity; and modernity. Students produce papers that culminate in a 25-page research project.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100, and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 190T - Latin America in the Cold War (5)

Writing-intensive seminar on Latin America during the Cold War. Particular attention given to U.S.-Latin American relations, including moments of covert or direct interventions.

Students pursue advanced research using primary and secondary sources.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100, and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 190U - Power, Culture, and the Federal Bureau of Investigation (5)

In this research seminar, students explore F.B.I. files obtained under the Freedom of Information Act on a prominent citizen of the United States of America.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100, and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 190W - U.S. Civil War and Reconstruction (5)

Students read historiographically significant works in the history of the U.S. Civil War and Reconstruction. Students develop research projects grounded in primary source material on a related topic of their choosing. (Formerly Topics in U.S. Civil War and Reconstruction.)

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100, and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 190X - History of the Atlantic World, 1492-1824 (5)

Explores the transatlantic societies created by Europeans' colonization of the Americas, and their exploitation of African slaves. Questions whether the cultural, economic, and political links across the ocean integrated the adjacent lands into a fundamentally Atlantic World.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100, and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 190Y - The Atlantic Slave Trade (5)

Before 1800, far more Africans than Europeans colonized the Americas, arriving unwillingly in the slave trade. Course examines the captives' experiences; the trade's organization and significance in the Atlantic economy; and the eventual movement to abolish the traffic.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100, and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 190Z - The Long Civil Rights Movement (5)

Explores the concept of the long civil rights movement as a framework for understanding a wide range of social, economic, and political developments in the African American freedom struggle, in both North and South, from the 1930s through the 1980s.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100, and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 192 - Directed Student Teaching (5)

Teaching of a lower-division seminar under faculty supervision. (See HIS 42.) Students submit petition to sponsoring agency.

HIS 193 - Field Study (5)

To allow promising, well-qualified undergraduates to pursue directed programs of archival or archaeological study in the field under supervision of the UCSC history faculty, concentrating their work within a single given quarter. Students may take two or three courses concurrently. Students submit petition to sponsoring agency.

HIS 194A - Gender, Class, and Sex in Shanghai (5)

Focusing on Shanghai, course examines issues of gender, class, and sex in modern urban Chinese history. Given Shanghai's history as a treaty port, particular attention paid to ways in which its semi-colonial status inflected the articulation of gender identities, class formations and issues of sexuality (particularly sexual labor). Also looks at Shanghai during the Maoist period and in the context of more contemporary economic reforms.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; HIS 100; and HIS 140C, or HIS 140D, or HIS 140E, and one additional upper-division history course; or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 194B - Okinawan History (5)

Examines the history of Okinawa with particular attention paid to the modern era. The goal is to give students a solid foundation in the historiography of major themes in the study of Okinawan society.

Prerequisite: Prerequisite(s): Satisfaction of the Entry Level Writing and Composition requirements, and HIS 100, and two additional upper-division history courses; or by permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 194C - Topics in Modern Chinese History (5)

Explores important themes in modern Chinese history ranging from empire and nation-state formation, foreign imperialism, revolutionary movements and politics, global capitalism, and social and cultural change. Teaches the writing of a major research paper using primary and secondary sources.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100, and two upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 194E - Women in Japanese History (5)

Examines through both primary and secondary sources such issues as work, sexuality, education, class, and ethnicity in relation to constructions of female gender in Japanese society over the past several centuries, particularly focusing on the modern era.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100 and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 194G - China Since the Cultural Revolution: Histories of the Present (5)

Explores the rapid and often destabilizing shifts that have taken place in China since the late 1970s (the reform era), tracing the effects of China's earlier experiment with revolutionary socialism on the market-driven present. Examines how various meanings of reform are negotiated; changes in rural and urban environments; and class, gender, and ethnic differences.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100 and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 194H - Gender, Family, and State in China: 1600-Present (5)

Explores gender, family, and state power in China from 1600 to present, examining gendered norms, education, political movements, revolutionary practice, sexuality and sex work, and state interventions in contemporary families. Responses to reading and a research paper required.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; HIS 100, and two additional upper-division history courses, or by permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 194J - The Poor and the Everyday in Modern China (5)

Focuses on non-elite people in modern Chinese history. Drawing on historical studies and contemporary accounts, this course looks at how colonialism, war, and revolutionary movements shaped everyday lives.

Prerequisite: Prerequisite(s): Satisfaction of the Entry Level Writing and Composition requirements, HIS 100 (for history majors), and two additional upper-division history courses, or by permission of instructor. Enrollment is restricted to junior and senior history majors and East Asian studies minors.

HIS 194K - Topics in the History of Southeast Asia (5)

Examines the history of lands, peoples, and cultures in Southeast Asia. Covers case studies from early modern history, imperial contact, colonization, decolonization, as well as contemporary political and social conditions, including studies of displacement and im/migration. Topics include comparative studies of colonialisms in the region; historiography of Southeast Asian studies in the United States; Southeast Asian technoscience and medicine; environmental history and eco-activism. As this course also qualifies as a senior exit seminar for history majors, the course dives into the particulars of academic research and writing. Students produce an original research paper that will be scaffolded throughout the term.

Prerequisite: Prerequisite(s): Satisfaction of the Entry Level Writing and Composition requirements, and HIS 100, and two additional upper-division history courses, or by permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 194L - Exile, Diaspora, and Displacement: Jewish Lives from North Africa to the Middle East (5)

From Medieval Spain, Ottoman Salonica, 20th-century Baghdad, present day Casablanca, and beyond, this course examines Jewish experiences of exile, diaspora, and displacement, as well as how to read memoir and biography as sources in their broader historical context.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100 (for history majors), and two upper-division history courses. Enrollment is restricted to junior and senior history majors and Jewish studies majors and minors.

HIS 194M - Literati, Samurai, and Yangban: Comparative History of State and Elite in East Asia, 1600-1900 (5)

Critically examines the formation of political elites in East Asia. Compares literati in Ming and Qing, China; samurai in Tokugawa, Japan; and yangban in Joseon, Korea. Each group occupied specific roles and functions in their state and society but differed in scale and character. Students cannot receive credit for this course and HIS 294M.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100 (for history majors), two additional upper-division history courses, or permission of the instructor. Enrollment is restricted to junior and senior history majors and East Asian studies minors.

HIS 194N - Urbanites in the Global South, 18th Century to the Present (5)

Urbanization is an important aspect of the making of the Global South. This course introduces the histories of urbanization from the 18th Century to the present. Students read the works of historians, anthropologists, geographers, and sociologists.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; HIS 100, and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 194O - South Asia in the Twentieth Century (5)

Introduces students to key ideas and ideologues of the Indian nation and the practices of the late-colonial and post-colonial Indian State. In the process, students become familiar with themes like modernity, gender, state formation, space, nationalism, democracy, and development.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; HIS 100, and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 194P - Urban South Asia (5)

Introduces important themes in urban studies in South Asia in the pre-modern and modern periods. These include political economic change; competing imaginations of city life; urban politics; land use; urban planning; and cultural life among others. This course begins with a brief survey of urbanism in pre-modern South Asia but focuses mostly on urbanities in the early modern and modern periods.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; HIS 100, and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 194Q - Making Space in the Colonial and Post-Colonial World (5)

Explores the production and experience of new forms of space in the colonial and post-colonial world through historical, political, and anthropological case studies with an emphasis on the Middle East and Africa.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; HIS 100, and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 194S - Special Topics in Ancient Egyptian History (5)

Focuses on different topics in ancient Egyptian history. In addition to assigned readings, each student does additional research that culminates in a 20-page paper on a topic of the student's choice. General topics for the course vary from year to year.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; HIS 100 (for history majors), and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history and classical studies majors.

HIS 194T - Worlds of Labor in Asia (5)

Introduces students to important debates in labor studies in Asia. Studies the relationship between labor, capitalism, and imperialism. Also interrogates the relevance or irrelevance of Asia as a concept from the standpoint of labor.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, and HIS 100, and two upper-division history courses; or permission of the instructor. Enrollment is restricted to junior and senior history majors.

HIS 194U - The Cold War and East Asia (5)

Considers through primary and secondary sources the events and aftermath of the Cold War in East Asia in terms of state formation, domestic and foreign policy, and protest movements in China, Taiwan, Korea, and Japan with reference to Vietnam.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; HIS 100, and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 194V - Fascism and Anti-Fascism: The Global Spanish Civil War (5)

Widely considered the antechamber of WWII, the Spanish Civil War (1936-1939) was the first large-scale international clash of Fascists and anti-Fascists. It was simultaneously a national conflict and a global proxy war, colonial and anti-colonial; and yet, it is often overlooked.

Prerequisite: Prerequisite(s): Satisfaction of the Entry Level Writing and Composition requirements, HIS 100 (for history majors), and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors and Jewish studies majors and minors.

HIS 194W - Social Movements in the Modern Middle East (5)

This writing-intensive seminar explores the social movements sweeping the contemporary Middle East. Students pursue advanced research using primary and secondary sources.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; HIS 100, and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 194Y - Memories of WWII in the U.S. and Japan (5)

Research seminar comparing U.S. and Japanese memories of World War II. Topics include war origins, total war, the atomic bomb, war responsibility, reparations, memorials, museums, and monuments. Primary work devoted to research in original texts and documents.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; HIS 100, and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 194Z - Historical Memory and Historical Narration in China (5)

Examines major events in modern Chinese history, from the Manchu conquest (1644) through the Tian'anmen Square demonstrations (1989), exploring why and how collective

memories and new narratives about such events have been transmitted and have shaped politics in the present.

Prerequisite: Prerequisite(s): Satisfaction of the Entry Level Writing and Composition requirements; HIS 100 (for history majors), and two additional upper-division history courses, or by permission of instructor. Enrollment is restricted to junior and senior history majors and East Asian studies minors.

HIS 195A - Thesis Research (5)

Prerequisite(s): petition on file with sponsoring agency (students should have completed two upper-division courses, preferably in their area of concentration).

HIS 195B - Thesis Writing (5)

Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; petition on file with sponsoring agency (students should have completed two upper-division courses, preferably in their area of concentration).

HIS 196C - Modern Italian Culture (5)

Developments in Italian culture and society from the postwar to the present. Topics include north-south divisions, family and gender, cinema and modernity, urbanization, mafia, and terrorism.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing Requirement; HIS 100 (for HIS majors); HIS 164A, HIS 164B, HIS 183A, or HIS 183B, or permission of instructor and one additional upper-division history course; Enrollment is restricted to junior and senior history and Italian studies majors.

HIS 196D - City of Rome (5)

Explores the long-term urban history of Rome from its founding through the modern tourist city. Emphasizes the cityscape and geographical centers of political power, culture, and religion, as well as the everyday life of neighborhoods.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; HIS 100 (for history majors), and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history, classical studies, and Italian studies majors. . . .

HIS 196E - Modern Irish History (5)

Aims to illuminate major themes and turning points of modern Irish history: the causes and consequences of the famine; the development of Irish nationalism; revolution, civil war, and partition; and the recent economic boom.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, and HIS 100, and two upper-division history courses; or by permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 196F - Topics in European Environmental History (5)

Examines the history of Europe and its empires within the context of human interactions with and attitudes toward a changing natural world. Topics include: European imperialism

in ecological perspective; the effects of new developments in science and technology on urban and rural environments; the rise of public health, sanitation, and colonial medicine; environmental justice; and the historical context of contemporary environmental problems.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, and HIS 100, and two upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 196G - Topics in Modern Germany and Europe (5)

A senior reading and research seminar that explores the selected historiographic debates in German history during the 19th and 20th centuries. (Formerly Modern Germany and Europe.)

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100 (for history majors), and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history and Jewish studies majors.

HIS 196H - Sex and the City--The History of Sexuality in Urban Areas Around the Globe (5)

Focuses on the history of sexuality in major urban areas globally. Topics include: sexual identities and race, class, and gender; sex work, policing, and urban spaces; gay, lesbian, and transgender communities; race, gender, and sexuality within the context of colonialism.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; HIS 100, and two additional upper-division history courses, or by permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 196I - The French Revolution (5)

Students conduct original research on the French Revolution of 1789 based on mix of primary and secondary courses. Classroom discussions focus on interpreting contemporary documents and addressing historiographical issues. Seminar format with significant written requirements. Presumes familiarity with the period.

Prerequisite: Prerequisite(s): Satisfaction of the Entry Level Writing and Composition requirements, and HIS 100, and two additional upper-division history courses, or by permission of instructor. HIS 70A and/or HIS 170A recommended as preparation. Enrollment is restricted to junior and senior history majors.

HIS 196K - Studies in European Intellectual History (5)

Topics in European intellectual history from the French Revolution to World War I. Readings exemplifying approaches from history of ideas and intellectual biography to recent studies of rhetoric and political culture. Preparation and presentation of research paper.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100 and two additional upper-division history courses, or permission of

instructor. Enrollment is restricted to junior and senior history majors.

HIS 196M - Shtetl: Eastern European Jewish Life (5)

For several centuries, the shtetl functioned as the center of Jewish life in Eastern Europe. Alternately mythologized and pathologized, the shtetl continues to exist as an imaginary space that defines and distorts the historical image of Eastern European Jewish life. Students cannot receive credit for this course and course 257.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100 (for history majors), and two additional upper-division history courses. Enrollment is restricted to junior and senior history and Jewish studies majors.

HIS 196N - Eastern European Jewish Social History (5)

Study of 19th- and 20th-century Eastern European and Russian Jewish social history.

Prerequisite: Prerequisite(s): Satisfaction of the Entry Level Writing and Composition requirements, HIS 100 (for history majors), and two additional upper-division history courses. Enrollment is restricted to junior and senior history and Jewish studies majors.

HIS 196Q - Europe and the World During the Cold War (5)

Explores European history from the end of World War II through the fall of the Soviet Union. Examines how Europe evolved from a fragmented, polarized array of colonial rivals to a more economically and culturally integrated place.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; HIS 100 and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 196S - Special Topics in Ancient History (5)

Seminar focuses on different topics in ancient history. In addition to assigned readings, the student is expected to do additional research that culminates in a 20-page paper on a topic of the student's choice. General topics for the course will vary from year to year.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100 (for history majors), and two additional two upper-division history courses; or permission of instructor. Enrollment is restricted to junior and senior history and classical studies majors.

HIS 196U - Topics in Medieval History (5)

Addresses contemporary and modern interpretations of the events relation to medieval history. Through critical discussion and debate, assesses the value and limitations of various historical sources, as well as developing skills in research, presentation-making, and writing.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100, and two

additional two upper-division history courses; or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 196Y - Saints and Holiness in Medieval Europe (5)

Examines popular religious belief and practice, including conversion, the cult of the saints, relics, pilgrimage, miracles and visions. Emphasis on Medieval Europe, but some attention also paid to modern patterns of devotion.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100, and two additional two upper-division history courses; or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 196Z - Europe from the Margins: Outside Influences on Modern European Thought and Culture (5)

Europe's engagement with the outside world, which ranged from cultural and intellectual borrowings to relations of domination and colonialism, shaped its modern history and culture. This course examines the cultural and intellectual history of modern Europe by focusing on the ways in which European thinkers and cultural producers drew upon or were influenced by non-European sources.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, HIS 100, and two additional upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors.

HIS 198 - Independent Field Study (5)

Student's supervision is conducted by a regularly appointed officer of instruction by means other than the usual supervision in person (e.g., by correspondence) or student is doing all or most of the course work off campus.

HIS 199 - Tutorial (5)

Students submit petition to sponsoring agency.

HIS 199F - Tutorial (2)

Students submit petition to sponsoring agency.

Graduate

HIS 200 - Methods and Theories of History (5)

An overview of theories, methods, and philosophies concerning the nature and production of history. Topics vary with instructor.

Prerequisite: Enrollment is restricted to graduate history students and others by permission of instructor.

HIS 201 - Directed Research Colloquium (5)

Having already prepared a bibliography and research prospectus in a graduate research seminar, students will undertake further research on their projects, write a 25–30 page research paper, and present their work to their fellow students.

Prerequisite: Prerequisite(s): history graduate research seminar. Enrollment is restricted to graduate history students.

HIS 202 - Practicing World History (5)

Because world history surfaces in curriculums at all educational levels, this seminar interrogates its value. Why do historians advocate world (and transnational) history? How do historians actually practice it? What are the pitfalls? Can global perspectives apply to localized subjects?

Prerequisite: Enrollment is restricted to graduate students.

HIS 203 - Global Decolonization (5)

Focuses on the histories and theories of decolonization in the mid-to-late 20th century, particularly, interactions among anticolonial movements, how Cold War era antagonisms inflected the process of decolonization, and efforts to forge Afro-Asian unity and/or a nonalignment movement.

Prerequisite: Enrollment is restricted to graduate students.

HIS 204A - History of Gender Research Seminar (5)

Introduction to theories and methods employed in gendered historical research. Readings are drawn from a range of chronological, national, and thematic fields and explore the intersection of gender analysis with such historical problems as the body and sexuality, modernity, national identity, and production/consumption.

Prerequisite: Enrollment is restricted to graduate students.

HIS 204B - Approaches to Social and Cultural History (5)

Graduate reading course focusing on both classic and contemporary approaches to social and cultural history. Readings include: Bakhtin, Benjamin, Foucault, Auerbach, and Berlin, and a variety of more recent studies in social, cultural, and intellectual history. Course not limited to graduate students in History.

Prerequisite: Enrollment is restricted to graduate students.

HIS 204C - Colonialism, Nationalism and Race Research Seminar (5)

Research seminar introducing theories and methods of the comparative histories of race, ethnicity, colonialism, and nationalism.

Prerequisite: Enrollment is restricted to graduate students.

HIS 204E - Transnationalism, Borderlands, and History (5)

Graduate seminar exploring the history of Canada-United States-Mexico borderlands. Approaches and arguments compare nation-state centered histories with narratives that construct the North American borderlands as places wrought from a multiplicity of overlapping indigenous, imperial, national, transnational, and global forces.

Prerequisite: Prerequisite(s): Enrollment is restricted to graduate students.

HIS 205 - Diaspora and World History (5)

Examines the histories and historiography concerning diaspora. This area of study includes populations from Asia, Africa, Europe, and the Americas. Students study the histories of diasporic populations, and the questions, theory, and methods that scholars use to approach the subject.

Prerequisite: Enrollment is restricted to graduate students.

HIS 206 - Empire in World History (5)

Introduces the study of empire (as opposed to nations, regions, or continents) as an approach to world history and to recent historiographical trends in the history of empires.

Prerequisite: Enrollment is restricted to graduate students.

HIS 208 - An Introduction to Digital Humanities (5)

Critically examines how digital processes are changing scholarly practice and pedagogy in the humanities. Students experiment with how digital media can impact research and communication for textual scholars, museum professionals, archivists, librarians, public historians and educators.

Prerequisite: Enrollment is restricted to graduate students.

Crosslisted as: Enrollment is restricted to graduate students.

HIS 210A - Readings in U.S. History (5)

Introduction to major themes and controversies in the interpretation of U.S. history. Readings cover both chronological eras and topical subjects, often in a comparative context: colonial and early national periods.

Prerequisite: Enrollment is restricted to graduate students.

HIS 210B - Readings in U.S. History (5)

Introduction to major themes and controversies in the interpretation of U.S. history. Readings cover both chronological eras and topical subjects, often in a comparative context: 19th century.

Prerequisite: Enrollment is restricted to graduate students.

HIS 211A - Research Seminar in Early American History (5)

First quarter of a two-quarter introduction to research in early American history (1550-1820). Readings include both historiographically definitive texts as well as recent scholarship reflecting the field's developments. Students complete analyses of historical sources, brief critical essays, and a significant research project. HIS 211A is not a prerequisite to HIS 211B.

Prerequisite: Enrollment is restricted to graduate students.

HIS 211B - Research Seminar in Early American History (5)

Second quarter of a two-quarter introduction to research in early American history (1550-1820). Readings include both historiographically definitive texts as well as recent scholarship reflecting the field's developments. Students complete analyses of historical sources, brief critical essays, and a significant research project. HIS 211A is not a prerequisite to HIS 211B.

Prerequisite: Enrollment is restricted to graduate students.

HIS 212A - Citizenship in U.S. History (5)

A reading-intensive graduate seminar in United States history that examines citizenship and its exclusions, grounded in race, gender, sexuality, age, and disability. This seminar also explores how forms of belonging intersected with evolving understandings of nationalism and sovereignty.

Prerequisite: Enrollment is restricted to graduate students.

HIS 212B - Citizenship in United States History (5)

A reading-intensive graduate seminar in United States history examining citizenship and its exclusions, grounded in race, gender, sexuality, age, and disability. The course also explores how forms of belonging intersected with evolving understandings of nationalism and sovereignty.

Prerequisite: Enrollment is restricted to history graduate students.

HIS 214 - California History (5)

Concerns the history and historiography of California from indigenous dominion to the present. Considers the distinctive ways in which California has led the nation and globe in economic, political, and social change, while remaining a multiethnic borderland.

Prerequisite: Enrollment is restricted to graduate students.

HIS 215A - Topics in American History: U.S. Labor and Working Class History (5)

Addresses topics in history of working people, the labor movement broadly defined, and political-economic change in the U.S. Topics include race, ethnic and gender dynamics, and U.S. labor and working-class history in global context.

Prerequisite: Enrollment is restricted to graduate students.

HIS 215B - Visions of Progress (5)

Explores the emergence of the welfare/regulatory state in the United States from the 1870s to World War I, examining different schools of historical thought about this period.

Prerequisite: Enrollment is restricted to graduate students.

HIS 215C - U.S. Immigration and Ethnic History (5)

Introduces key issues and debates in United States immigration and ethnic history. Topics include causes of immigration; constructions of race, gender and ethnicity; assimilation; transnationalism; and forces shaping immigration policy.

Prerequisite: Enrollment is restricted to graduate students.

HIS 216 - Readings in the History of American Religions (5)

Research in the history of religions in the United States. Addresses topics, such as the rise of evangelicalism; class, race, and religious diversity; gender and power; modernity; and civil religion through analyses of visual and literary texts, iconography, ritual, theology, and praxis.

Prerequisite: Enrollment is restricted to graduate students.

HIS 217 - Critical Conversations in Native American History (5)

Overview of key historical texts focusing on the Native American experience, with particular focus on scholarship that seeks to decolonize Western methodologies and research practices. Readings explore such topics as decolonization, indigenous identity, sovereignty, repatriation efforts, gender and sexuality, and historical memory. The format consists of discussions of readings. Students give oral presentations on the readings, and write book reviews and a final historiographical paper.

Prerequisite: Enrollment is restricted to graduate students.

HIS 220 - The Atlantic World, 1500-1800 (5)

Explores the economic, social, and cultural history of early America in terms of its Atlantic connections and intersection with the cultures of early modern Europe, Africa, and Latin America. Builds upon previous work in early America and early modern Europe, challenging students both to work comparatively and to break out of traditional geographic models.

Prerequisite: Enrollment is restricted to graduate students.

HIS 221 - Empires and New Nations in the Americas (5)

Compares the history of the colonial and 19th-century Americans through a world-history perspective. Focuses on the interrelated themes of indigenous histories, slavery and other forms of servitude, commodity production, and the meaning of equality and freedom in new nations.

Prerequisite: Enrollment is restricted to graduate students.

HIS 222 - Global Sexualities--A Seminar in the Queering of Historiographies (5)

Explores the history of sexuality covering diverse time periods, peoples, and regions. Examines methods and theories used in the study of sexuality. Readings draw from the Americas, Middle East, Africa, Europe, and Austro-Asia, as well as topics in queer and LGBTQ2 studies.

Prerequisite: Enrollment is restricted to graduate students.

HIS 225 - Spanish Colonialism (5)

Reading-intensive graduate seminar with emphasis on theoretical and historiographical questions regarding the field of Spanish colonialism in the Americas. Students encouraged to engage in discussions of comparative colonialisms.

Prerequisite: Enrollment is restricted to graduate students.

HIS 227 - Gender and Colonialism (5)

Explores the relationship between colonialism and gender. Examines the construction of gender categories (in conjunction with race) in the context of colonial conquest and rule; contested definitions of motherhood, domesticity, and citizenship; and regulation of sexuality.

Prerequisite: Enrollment is restricted to graduate students.

HIS 229 - Worlds of Labor in Asia (5)

Introduces students to important debates in labor studies in Asia. Studies the relationship between labor, capitalism, and imperialism. Also interrogates the relevance or irrelevance of Asia as a concept from the standpoint of labor.

Prerequisite: Enrollment is restricted to graduate students.

HIS 230A - Readings in Late Imperial China (5)

Survey of the major works on and historiographical controversies about Qing Dynasty (1644–1911) China.

Prerequisite: Enrollment is restricted to graduate students.

HIS 230B - Engendering China (5)

Reading seminar on the history of Chinese gender, focusing on the Qing dynasty (1644 to 1911) to the present. Topics include marriage and family, sexuality, work, the gendered language of politics, and major reform movements.

Prerequisite: Enrollment is restricted to graduate students.

HIS 230C - Readings in 20th-Century China (5)

A survey of major Western-language works and historiographical controversies in Chinese history from 1900 to the present. Weekly readings emphasize particular social and political movements as well as long-term changes in urban and rural society.

Prerequisite: Enrollment is restricted to graduate students.

HIS 231 - Historicizing the People's Republic of China (5)

An overview of the scholarly literature on the People's Republic of China. Readings include works by historians as well as by social scientists. Students consider what kinds of questions historians have and can ask.

Prerequisite: Enrollment is restricted to graduate students.

HIS 238A - Research Methods: China (5)

An introduction for graduate students to the use of major research tools and sources in Chinese history since 1600, with a focus on 20th-century materials. Students complete a series of bibliographical exercises and prepare a research prospectus.

Prerequisite: Enrollment is restricted to graduate students.

HIS 238B - Research Methods: China (5)

Building on the research and bibliographic skills developed in course 228A, students develop a research topic and write a paper of 20-30 pages using primary sources as appropriate in English, Chinese, and/or Japanese.

Prerequisite: Enrollment is restricted to graduate students.

HIS 242 - Readings in Modern Japan (5)

A graduate course intended to give students a fundamental understanding of the major themes in the study of modern Japanese history. Central themes include modernity and

modernization, colonialism, postwar recovery, gender, race, and nationalism.

Prerequisite: Enrollment is restricted to graduate students.

HIS 243 - Transnational Japan (5)

Examines how Japanese history has been forged across, outside, and beyond the boundaries of the modern nation-state of Japan. Considers how Japan has transformed the world. Students debate how the world made Japan and how Japan re-made the world.

Prerequisite: Enrollment is restricted to graduate students.

HIS 244 - Gender and Japanese History (5)

Examines—through primary and secondary sources—constructions of gender (masculine, feminine, and transgender) in Japanese society over the past several centuries, focusing on the modern era.

Prerequisite: Enrollment is restricted to graduate students.

HIS 251A - Readings in Modern European History: Environment and Technology (5)

Introduces major themes and problems in recent historiographical trends in environmental history and the history of technology. Examines the role of environment and technology in the making of Europe and European societies' engagement with the world.

Prerequisite: Enrollment is restricted to graduate students.

HIS 251B - Readings in Modern European History: Empire (5)

The history of empire has emerged as one of the most influential and fastest growing areas of inquiry within the field of modern European history. This course introduces students to recent debates and trends in imperial, colonial, and postcolonial history.

Prerequisite: Enrollment is restricted to graduate students.

HIS 252 - Republicanism and Its Discontents: Universal Projects and Particular Discriminations (5)

Focuses on the histories and theories of republicanism and liberalism by investigating the tension between universal ideologies and discriminatory practices. Focuses on France and the United States, but Algeria, Syria, and Turkey will also be covered.

Prerequisite: Enrollment is restricted to graduate students.

HIS 255 - Religion and Modernity (5)

Examines the significance of religion and secularism in the modern period. How did modernity and the concept of the secular transform various religions and how, in turn, did these religions help to create modernity.

Prerequisite: Enrollment is restricted to graduate students.

HIS 257 - Shtetl: Eastern European Jewish Life (5)

For several centuries, the shtetl functioned as the center of Jewish life in Eastern Europe. Alternately mythologized and pathologized, the shtetl continues to exist as an imaginary space that defines and distorts the historical image of Eastern European Jewish life. Students cannot receive credit for this course and HIS 196M.

Prerequisite: Enrollment is restricted to graduate students.

HIS 260 - History and the Spatial Turn: Making Space, Place, and Geography in History (5)

Explores the making of space, place, and geography in a body of recent historical work. Explores key theoretical work interrogating the significance of space as a critical element of social theory and historical consideration. Proceeds through three thematic units: questions of colonial economy in South Asia; spaces of empires and its end in the Eastern Mediterranean; and histories of infrastructure.

Prerequisite: Enrollment is restricted to graduate students.

HIS 261 - The Contours of the New Middle East History (5)

Explores the history and historiography of the modern Middle East through recent historical scholarship. Examines the new theoretical approaches that frame inquiries into the region's history and how contemporary historians are reinterpreting familiar questions and themes.

Prerequisite: Enrollment is restricted to graduate students.

HIS 265 - History of the Body (5)

A multidisciplinary history of the body from late antiquity to the present. Topics include: medical and religious constructions; the raced, gendered, and sexualized body; adornment and performance markers; power and control through the body; body parts; and the body's permeability.

Prerequisite: Enrollment is restricted to graduate students.

HIS 280A - History Graduate Proseminar: Teaching Pedagogy (2)

Devoted to professionalism and socialization of history graduate students. Includes formal and informal meetings with faculty and other graduate students. Topics include TAs, designing course syllabi, pedagogy, teaching technologies, and teaching in different venues.

Prerequisite: This course is required for first-year students; however, it is open to all other graduate students as needed. Enrollment is restricted to graduate students .

HIS 280B - History Graduate Proseminar: Research Presentations and Grant Writing (2)

Devoted to professionalism and socialization of history graduate students. Topics include discussion of researching grants; effective CV writing; successful grant applications and publication proposals; and conference paper and panel proposals. Required for first-year graduate students; however, open to all history graduate students as needed.

Prerequisite: This course is required for first-year students; however, it is open to all other graduate students as needed. Enrollment is restricted to graduate students .

HIS 280C - History Graduate Proseminar: Job Market (2)

Devoted to professionalism and socialization of history graduate students. Includes formal and informal meetings with faculty and other graduate students. Topics include researching position; preparing a CV and the job-application letter; preparing for an interview; practice interview; preparing a job talk and/or teaching presentation; and practice job talk.

Prerequisite: This course is required for first-year students; however, it is open to all other graduate students as needed. Enrollment is restricted to graduate students .

HIS 283 - Foreign Language Preparation (2)

Independent study course in which history graduate student reads selected texts to fulfill foreign language requirement. Student meets with instructor to discuss readings, deepening his knowledge of the foreign language. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

HIS 284 - Qualifying Examination Preparation (2)

Independent study course designed to help students prepare for qualifying exams. Students meet on regular basis with one or more members of qualifying examination committee to monitor preparation for exam. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

HIS 285 - Readings in Research Field (2)

Independent study focusing on selected texts or authors in history or historical theory. Students meet on regular basis with instructor to discuss readings and deepen their knowledge of a particular author or historical theory. Students submit petition to sponsoring agency.

Prerequisite: Enrollment restricted to graduate students.

HIS 285B - Readings in Research Field (5)

Independent study focusing on selected texts or authors in history or historical theory. Students meet on regular basis with instructor to discuss readings. Students submit petition to sponsoring agency.

HIS 286 - Research Colloquium on Colonialism, Nationalism, and Race (2)

Acquaints students with the department's thematic research clusters in their field to coordinate training in historical research. Students meet on a regular basis with a faculty member of a particular cluster to discuss most important readings in the field. Enrollment restricted to graduate students.

Prerequisite: Enrollment is restricted to graduate students.

HIS 287 - Research Colloquium on Gender (2)

Acquaints students with the department's thematic research clusters in their field to coordinate training in historical research. Students meet on a regular basis with a faculty

member of this cluster to discuss most important readings in their field. Enrollment restricted to graduate students.

Prerequisite: Enrollment is restricted to graduate students.

HIS 288 - Teaching Assistant Preparation (2)

Independent study designed to help history graduate students prepare to teach in an area of history outside their specialization. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

HIS 289 - History Colloquium (2)

Independent study designed to foster departmental and cross-disciplinary participation in campus talks, colloquia, conferences, and events. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

HIS 294M - Literati, Samurai, and Yangban: A Comparative History of State (5)

Critically examines the formation of political elites in East Asia. Compares literati in Ming and Qing China; samurai in Tokugawa, Japan; and yangban in Joseon, Korea. Each group occupied specific roles and functions in their state and society but differed in scale and character. Students cannot receive credit for this course and HIS 194M.

Prerequisite: Enrollment is restricted to graduate students.

HIS 297A - Independent Study (5)

Students submit petition to sponsoring agency.

HIS 297B - Independent Study (10)

Students submit petition to sponsoring agency.

HIS 297C - Independent Study (15)

Students submit petition to sponsoring agency.

HIS 299A - Thesis Research (5)

Students submit petition to sponsoring agency.

HIS 299B - Thesis Research (10)

Students submit petition to sponsoring agency.

HIS 299C - Thesis Research (15)

Students submit petition to sponsoring agency.

HCI-HUMAN COMPUTER INTERACTION

Graduate

HCI 200 - Introduction to HCI (5)

Introduction to the core premises of human-computer interaction (HCI), including major phases in the evolution of HCI. Issues covered include the origins of HCI and its transformation alongside the spread of computing technologies into the fabric of everyday life.

Prerequisite: Enrollment is restricted to human computer interaction graduate students.

HCI 201 - Introduction to Design Methods in HCI (5)

Introduction to design methods in human-computer interaction (HCI). Students gain mastery of ideation, sketching, prototyping, and other current methods used in HCI design practice.

Prerequisite: Enrollment is restricted to human computer interaction graduate students.

HCI 202A - Introduction to HCI Build: Bootcamp (5)

Introductory build course that includes an introduction to hardware prototyping, introduction to programming, and introduction to soft electronics. Provides students with hardware/software skills that enable them to rapidly prototype interface concepts that include both physical and digital elements.

Prerequisite: Enrollment is restricted to graduate students.

HCI 202B - Introduction to Build: Advanced (5)

Advanced course on build methods in HCI. Includes hardware prototyping, advanced programming, and development of soft electronics systems. Provides students with existing technical competency the opportunity to produce robust physical-digital prototype systems.

Prerequisite: Enrollment is restricted to human computer interaction graduate students.

HCI 203 - Introduction to Research (5)

Introduction to research and analysis methods in human-computer interaction (HCI). Introduces theoretical perspectives on HCI arising from cognitive science, sociology, and distributed cognition. Explores the key methods to apply and test these theories including: designing and conducting studies, statistics, analysis, heuristic evaluation, ethnography, interviews, surveys, field studies, and other established methods used by HCI practitioners.

Prerequisite: Enrollment is restricted to human computer interaction graduate students.

HCI 271 - HCI Capstone 1 (5)

Teaches students how to form project teams, brainstorm, and iterate ideas for the capstone projects, culminating in approved briefs and project teams, including an approved committee of advisers for each project. Advisers may be local industry people (including industry partners who have proposed projects), or may also be UCSC faculty from the main campus.

Prerequisite: Prerequisite(s): HCI 200, HCI 201, and either HCI 202A or HCI 202B. Enrollment is restricted to human computer interaction graduate students.

HCI 272 - Capstone 2 (5)

The goal of this course is for students in the Professional Master's Degree in Human-Computer Interaction to produce

successful capstone projects. The course is organized around iterative feedback from peers and project advisers (both academic and professional), and includes extensive workshopping, critique, and testing. The course culminates in an end-of-quarter showcase of student work, with all project advisers and project sponsors invited. Also includes professional development.

Prerequisite: Prerequisite(s): HCI 271. Enrollment is restricted to human computer interaction graduate students.

HCI 290 - HCI Seminar (2)

Weekly speakers on human-computer interaction topics. Course can be taken for Satisfactory/Unsatisfactory credit only.

Prerequisite: Enrollment is restricted to graduate students.

ITAL - ITALIAN

Lower-Division

ITAL 1 - First-Year Italian (5)

During the first quarter of this first-year sequence, students learn to introduce themselves, to talk about their daily activities and hobbies, to describe themselves and their friends/families, and to recount past events. The first-year sequence (1-2-3) begins in fall quarter.

ITAL 1A - Accelerated Italian (5)

The first quarter of accelerated instruction in elementary Italian language. The accelerated pace allows a rapid mastery of grammar and vocabulary, giving students a basic knowledge of Italian in only two quarters. Completion of the sequence is equivalent to the completion of the 1-2-3 sequence. This sequence starts once a year in the winter quarter.

ITAL 1B - Accelerated Italian (5)

The second quarter of accelerated instruction in elementary Italian language. The accelerated pace allows a rapid mastery of grammar and vocabulary, giving students a basic knowledge of Italian in only two quarters. Completion of the sequence is equivalent to the completion of the 1-2-3 sequence.

Prerequisite: Prerequisite(s): ITAL 1A or ITAL 2 or placement by examination. For students completing ITAL 2, ITAL 3 is preferable.

ITAL 2 - First-Year Italian (5)

During the second quarter of this first-year sequence, students learn to tell a story in the past, to make plans about their future, and to express commands and requests. The sequence starts once a year in the fall quarter.

Prerequisite: Prerequisite(s): ITAL 1 or placement by examination.

ITAL 3 - First-Year Italian (5)

During the third quarter of this first-year sequence, students learn to talk about historical events, to formulate hypothetical scenarios, to express wishes, desires, doubts, and opinions, and

to discuss more abstract topics (e.g., immigration, work, politics).

Prerequisite: Prerequisite(s): ITAL 2 or placement by examination.

ITAL 4 - Second-Year Italian (5)

Short stories, articles, films, and newsclips are used as the basis for studying intermediate-level conversation and composition. Laboratory assignments involve use of the World Wide Web, conversations with native speakers, films and video clips. Students interested in this course who have not taken the prerequisite at UCSC should meet with the instructor, preferably prior to the first class meeting, and take the placement examination.

Prerequisite: Prerequisite(s): ITAL 1B or ITAL 3 or placement by examination.

ITAL 5 - Second-Year Italian (5)

Reading of Italian short stories and a play are used as basis for further study and refinement of oral and written skills at the intermediate level. Particular emphasis is placed on oral/written discussion of abstract ideas and topics, and on the study of different language registers/contexts. Laboratory work is regularly assigned. Students interested in this course who have not taken the prerequisite at UCSC should meet with the instructor, preferably prior to the first class meeting and take the placement examination.

Prerequisite: Prerequisite(s): ITAL 4 or placement by examination.

ITAL 6 - Second-Year Italian (5)

Reading of first novel in the language and weekly viewing of Italian films serve as basis for oral reports and discussions on various aspects of Italian culture and civilization. Weekly assignments, three essays, and a paper on topics derived from or related to the text. Students interested in this course who have not taken the prerequisite at UCSC should meet with the instructor, preferably prior to the first class meeting, and take the placement examination.

Prerequisite: Prerequisite(s): ITAL 5 or placement by examination.

ITAL 80 - Italian Culture Through Cinema (5)

Film is used as a medium through which images of Italians and their culture are disseminated, perpetuated, and crystallized. Whether these representations offer historical perspectives or stereotypes, they are important documents for the study of Italian culture, society, history, and politics. Students cannot receive credit for this course and Italian 106.

ITAL 94 - Group Tutorial (5)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Students submit petition to sponsoring agency.

ITAL 99 - Tutorial (5)

Students submit petition to sponsoring agency.

ITAL 99F - Tutorial (2)

Students submit petition to sponsoring agency.

Upper-Division

ITAL 100 - Advanced Italian Composition and Conversation (5)

Provides intensive practice in oral and written Italian. Focuses on vocabulary building and increased oral and written expression. Active student participation is essential and constitutes a significant portion of the course including class discussions, oral presentations, written reports, responses and essays, using different genres of writing, including, but not limited to diaries, epistles (formal and informal), blogs, text messaging, dialogues, short stories, memoirs, interviews, podcasts, and media language.

Prerequisite: Prerequisite(s): ITAL 6 or by permission of the instructor.

ITAL 101 - Italian Culture through Food (5)

Explores how the evolution of the Italian culinary tradition and the variety of eating habits reflect the historical and economical changes that took place in Italian society over the most recent centuries. Course is taught in English.

ITAL 106 - Italian Culture Through Film (5)

Film is used as a medium through which images of Italians and their culture are disseminated, perpetuated, and crystallized. Students focus on pivotal issues in Italian culture, society, history, and politics, and develop an informed opinion on relevant issues in Italian studies. The course is taught in English with a mandatory enhancement section in Italian. The enhancement section meets once a week and is designed to give students who are already familiar with the language the opportunity to discuss the films in Italian and to read/view additional material in the language. Students cannot receive credit for this course and ITAL 80.

Prerequisite: Prerequisite(s): ITAL 6.

ITAL 194 - Group Tutorial (5)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Students submit petition to sponsoring agency.

ITAL 199 - Tutorial (5)

Students submit petition to sponsoring agency.

ITAL 199F - Tutorial (2)

Students submit petition to sponsoring agency.

JAPN - JAPANESE

Lower-Division

JAPN 1 - First-Year Japanese (5)

Students carry out beginning-level tasks that involve listening, speaking, reading, and/or writing, and learn how to read and write Japanese scripts (hiragana, katakana, and about 40 kanji).

JAPN 2 - First-Year Japanese (5)

Students carry out beginning-level tasks that involve listening, speaking, reading, and/or writing, and learn how to read and write 70 additional kanji.

Prerequisite: Prerequisite(s): JAPN 1 or by consent of instructor.

JAPN 3 - First-Year Japanese (5)

Students carry out beginning-level tasks that involve listening, speaking, reading, and/or writing, and learn how to read and write 70 additional kanji.

Prerequisite: Prerequisite(s): JAPN 2 or by consent of instructor.

JAPN 4 - Second-Year Japanese (5)

Students carry out intermediate-level tasks that involve listening, speaking, reading, and/or writing, and learn how to read and write 70 additional kanji.

Prerequisite: Prerequisite(s): JAPN 3 or by consent of instructor.

JAPN 5 - Second-Year Japanese (5)

Students develop intermediate-level competence in listening, speaking, reading, and writing in diverse social contexts; acquire a deeper and broader understanding of Japanese society and culture; and learn how to read and write 70 additional kanji characters.

Prerequisite: Prerequisite(s): JAPN 4 or by consent of instructor.

JAPN 6 - Second-Year Japanese (5)

Students carry out intermediate-level tasks that involve listening, speaking, reading, and/or writing, and learn how to read and write 100 additional kanji. Emphasis is placed on developing the student's cultural knowledge relevant to inter-cultural communication.

Prerequisite: Prerequisite(s): JAPN 5 or by consent of instructor.

JAPN 94 - Group Tutorial (5)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Students submit petition to sponsoring agency.

JAPN 99 - Tutorial (5)

Students submit petition to sponsoring agency.

JAPN 99F - Tutorial (2)

Students submit petition to sponsoring agency.

Upper-Division

JAPN 103 - Advanced Japanese (5)

Students carry out advanced-level tasks that involve listening, speaking, reading, and/or writing, and learn how to read and write 100 additional kanji. Emphasis placed on developing the student's cultural knowledge about Japan as well as knowledge relevant to inter-cultural communication.

Prerequisite: Prerequisite(s): JAPN 6 or by consent of instructor.

JAPN 104 - Advanced Japanese (5)

Students carry out advanced-level tasks that involve listening, speaking, reading, and/or writing, and learn how to read and write 100 additional kanji. Emphasis placed on developing the student's cultural knowledge about Japan as well as knowledge relevant to inter-cultural communication.

Prerequisite: Prerequisite(s): JAPN 103 or by consent of instructor.

JAPN 105 - Advanced Japanese (5)

Students carry out advanced-level tasks that involve listening, speaking, reading, and/or writing, and learn how to read and write 100 additional kanji. Further development of cultural knowledge and understanding through critical examination of authentic Japanese materials in a variety of genres, including literary work, expository writing, and films. May be repeated for credit with consent of instructor.

Prerequisite: Prerequisite(s): JAPN 104 or by consent of instructor.

JAPN 106 - Advanced Japanese (5)

Students carry out advance-level tasks that involve listening, speaking, reading, and writing. Emphasis is placed on increasing the student's in-depth cultural knowledge about Japan and knowledge relevant to intercultural communication as well as developing the student's ability to critically read a variety of texts.

Prerequisite: Prerequisite(s): JAPN 104 or by permission of instructor.

JAPN 109 - Japanese Language, Culture, and Society (5)

Critical reading of Japanese texts, such as essays, film scripts, and novels in regard to linguistic diversity related to cultural and social diversity. Topics include standard Japanese and regional variation, politeness and honorifics, age-related stylistic variation, and gendered language.

Prerequisite: Prerequisite(s): JAPN 104 or by consent of instructor.

JAPN 194 - Group Tutorial (5)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Students submit petition to sponsoring agency.

JAPN 199 - Tutorial (5)

Students submit petition to sponsoring agency.

JAPN 199F - Tutorial (2)

Students submit petition to sponsoring agency.

JWST - JEWISH STUDIES

Lower-Division

JWST 99 - Tutorial (5)

Students submit petition to sponsoring agency.

Upper-Division

JWST 185N - The Holocaust in a Digital World (5)

Explores how digital tools change the way we know about the Holocaust by (1) critically understanding and analyzing digital representations of the Holocaust and (2) using and developing digital skills to engage with stories about the Holocaust.

Prerequisite: Enrollment is restricted to Jewish studies and history majors and minors during first-pass enrollment; open to all students at the start of second-pass enrollment.

JWST 195A - Thesis Research (5)

Devoted to independent research under the guidance of a primary thesis adviser. Students are expected to meet with their thesis adviser every two weeks to report on research progress and receive advice and criticism. Enrollment restricted to junior and senior Jewish studies majors. Students submit petition to sponsoring agency.

JWST 195B - Thesis Writing (5)

Devoted to independent writing under the guidance of the primary and secondary thesis faculty advisers. Completed theses must be a minimum of 40 pages in length. Student are required to meet regular with their faculty advisers and to submit at least two drafts for detailed criticism. Prerequisite(s): Satisfaction of the Entry Level Writing and Composition requirement. Enrollment restricted to junior and senior Jewish studies majors.

JWST 199 - Tutorial (5)

Students submit petition to sponsoring agency.

JWST 199F - Tutorial (2)

Students submit petition to sponsoring agency.

KRSG - KRESGE COLLEGE

Lower-Division

KRSG 1 - Academic Literacy and Ethos: Power and Representation (5)

Teaches foundational concepts for intellectual exploration and personal development within an academic community: analysis, critical thinking, metacognition, engagement with others across difference, and self-efficacy. Texts in varied media reflect individuals' and communities' struggles to represent, constitute, and empower themselves in the United States.

Prerequisite: Enrollment is restricted to first-year college members.

KRSG 1A - Introduction to University Life and Learning (1)

KRSG 1A explores opportunities, expectations, and responsibilities in university life. Topics include: academic planning; general education requirements; majors and minors; campus policy; and preparation for Kresge's core course: Power Representation. Students gain familiarity with resources for health, well-being, time management, academic success, cultivating just communities, sexual harassment and violence prevention, reflection on UCSC's principles of community, and an introduction to the living and learning tradition of KRSG College. This course can be taken for Pass/No Pass grading only.

Prerequisite: Enrollment is restricted to entering first-year Kresge College students.

KRSG 1T - Introduction to Research Universities and the Liberal Arts (1)

Orientation to and exploration of principles of liberal arts, and learning at research universities. Topics include: academic planning for upper-division coursework; enrollment processes at UCSC; understanding pathways to degree completion (and the major and general-education coursework required in those pathways). Students also learn about UCSC's principles of community, and engage in preliminary reflection on reading and critical thinking. This course is for entering transfer students. This course can be taken for Pass/No Pass grading only.

Prerequisite: Enrollment is restricted to transfer students.

KRSG 2 - Power and Representation in Media (3)

Introduction to media representations and their consequences for individuals and communities. Assignments emphasize dialogic and collaborative processes of critical reflection on media materials. Materials in a variety of media address struggles for representation, justice, and agency--especially relative to race, gender, citizenship/documentation, and communities of diaspora--in terms of media frameworks and the dialogues they foment.

KRSG 3 - Campus Natural History Practicum (2)

Develop practical skills and knowledge in naturalist observation. Acquire an overview of the field of natural history, particularly applied to the UCSC campus. Document an evolving and multidimensional personal experience of natural spaces, including, but not limited to, wilderness. (Formerly KRSG 18.)

KRSG 12A - Service Learning (3)

Students find a volunteer position with the instructor's assistance and perform community service in non-profit organizations, schools, unions, or local government agencies. Students meet weekly, keep a journal, and write a social action witnessing report of their experience.

Prerequisite: Enrollment is restricted to college members.

KRSG 12B - Service Learning (2)

Students find a volunteer position with the instructor's assistance and perform community service in non-profit organizations, schools, unions, or local government agencies. Students meet weekly, keep a journal, and write a social action witnessing report of their experience.

Prerequisite: Enrollment is restricted to college members.

KRSG 12C - Service Learning: Introduction to National Service/Introduction to Grant Writing (3)

A fast-paced and academically rigorous exercise in four main sections. First and foremost, participants must locate and support a community-service site for three hours each week. Each student's service commitment requires the student to attend class regularly and share community-service experience with classmates. Students are introduced to the basic requirements of a variety of national service agencies including AmeriCorp, the Peace Corp, City Year, Teach for America, and City Service. Students are required to do community-service work with a member of one of these agencies locally for four hours during the quarter. The last major section of this course teaches students the basics of grant writing and research.

Prerequisite: Enrollment is restricted to college members.

KRSG 15A - The Writer as Witness (3)

Students are involved in a community service project to produce a portfolio of social-action writing that situates the writer as witness in the community.

Prerequisite: Enrollment is restricted to college members.

KRSG 15B - The Writer as Witness (2)

Students are involved in a community-service project to produce a portfolio of social-action writing that situates the writer as witness in the community.

Prerequisite: Enrollment is restricted to college members.

KRSG 16 - The Rise of Capitalism and Its Consequences (5)

Explores the rise and consequences of capitalism. How has capitalism affected how humans understand and act in the

world? How do oppressions along lines of race, gender, sexuality, and nation intersect with capitalism? Is resistance desirable and/or possible?

Prerequisite: Enrollment is restricted to Kresge, Cowell, or Crown honors students.

KRSG 24 - Imagining Utopias (3)

Explores possible futures by studying several utopian visions, projects, and manifestos. Students imagine a future by writing a manifesto and other creative non-fiction pieces that embrace a utopian imagination.

Prerequisite: Enrollment is restricted to college members.

KRSG 25 - Successful Transfer to the Research University (2)

Provides community college transfers, during their first year at UC Santa Cruz, with an understanding of the workings of a research university with emphasis on advanced academic expectations, creating purposeful education and career goals, and navigating opportunities and challenges. Guides refinement of goals, development of an action plan to meet desired academic, career and civic-oriented outcomes, and encourages developing essential and enriching relationships to enrich UC Santa Cruz experience.

Prerequisite: Enrollment is restricted to first-quarter transfer students.

KRSG 26 - Navigating the Research University (2)

Explores critical engagement in education in the context of a research university. Introduces first-year issues and success strategies and ways to participate in the institution's academic life. Investigates strategies for clarifying education goals and devising a plan for success. Students cannot receive credit for this course and PRTR 26 or STEV 26.

Prerequisite: Enrollment is restricted to first-year Kresge and Porter College members.

KRSG 45 - Achieving Consensus in Diverse Communities (5)

Defines consensus in terms of inclusive decision-making and explores depth-psychology approaches to facilitating social agreement in culturally diverse settings. Readings include Totem and Taboo, Diversity Calling, and selected articles related to issues of cultural literacy. Recommended for, but not limited to, social science majors.

Prerequisite: Enrollment is restricted to Kresge College and Oakes College affiliates or by permission of the instructor.

KRSG 51 - City on a Hill Press Practicum in Production (2)

Students work collaboratively on City on a Hill Press, the student-run, campus newspaper of record, gaining practice in news production. Students engage in analysis and critical reflection regarding both the form and content of news, and its critical relationship to a healthy democracy. Course outcomes include the development of media literacy, and experience addressing issues such as intent, fairness, accuracy, and impact. Areas of focus include, but are not limited to, graphic design, illustration, photojournalism, visual composition, copy editing,

fact-checking, and media literacy. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment is by permission of the instructor in consultation with City on a Hill Press co-editors-in-chief.

KRSG 52 - City on a Hill Press Practicum in Reporting and Editing (5)

Students work collaboratively on City on a Hill Press, the student-run, campus newspaper of record, gaining practice in investigative journalism and news editing. Students engage in analysis and critical reflection regarding both the form and content of news, and its critical relationship to a healthy democracy. Course outcomes include the development of media literacy, and experience addressing issues such as intent, fairness, accuracy, and impact. Areas of focus include, but are not limited to, story production, story assignment and management, and staff editorial composition. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment is by permission of the instructor, in consultation with City on a Hill Press co-editors-in-chief.

KRSG 60C - Prison Narratives (3)

Survey of narratives of prison experience, supporting inquiry into the role of prisons in U.S. society. Addresses themes including, but not limited to, prison abolition, re-entry, the school-to-prison pipeline, capital punishment, sentencing of minors, and political prisoners. Emphasis on voices of the imprisoned, and their advocates. Students engage in collaborative projects throughout the class, and learn effective strategies for group work and interpersonal communication.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to college members.

KRSG 60F - Writer's Read (2)

Students attend weekly creative writing readings by fiction writers and poets, read excerpts from the writers' works, participate in question and answer sessions, and write short, creative and/or analytical responses to the readings and writings.

Prerequisite: Enrollment is restricted to Kresge and Porter college members.

KRSG 62 - Transformative Action (5)

Introduces key skills for effective transformation agents including: creativity and innovation; transformative communication; servant leadership; optimism and resilience, risk taking, initiative; luck; failure; and relationship building. Students create their own portfolio and commit to weekly civic engagement projects.

KRSG 62A - Transformative Action (2)

Addresses the most effective methods of social change. Examines principles and strategies of transformative action and case studies of leaders solving world problems. Empowers students to be innovators in real-life community projects. Integrates nonviolence, psychology, sustainability, and social justice.

KRSG 62B - Transformative Action Seminar (2)

For students who enrolled in the winter quarter Transformative Action course, to further investigate, research, and refine their Big Idea. Opportunity given to deepen and integrate Transformative Action principles into projects. Enrollment by instructor permission only.

KRSG 63 - Kresge Garden Cooperative (2)

Hands-on practice with basic ecological horticulture skills through work at the Kresge Garden, including soil cultivation. Enrollment by instructor approval through application (available in the Kresge College office). Enrollment limited to college members.

KRSG 64 - Tools for World Changers (2)

Develops life skills that support you and help you support others. Implement effective methods for personal productivity (managing your to-dos, calendar, and inbox), interpersonal communication, meeting facilitation, event hosting, collaboration, and regenerative community design.

KRSG 65A - Power and Representation: Food and Community (2)

Explores core themes of power and representation through the mediums of food, nature awareness, community, personal empowerment and sustainable living. Students will develop meaningful final projects in collaboration with Kresge Food Co-op, Kresge Garden Co-op, Kresge World Cafe, and projects of their own design.

KRSG 65F - Kresge Lab: Photography (2)

A course of practical guidance in developing skills and creative approaches in photography; also a group setting for critique and feedback. Students do in-class and out-of-class assignments in photography and development, discuss examples of photographic art in various communities and subgenera, and apply principles to their own work in a final portfolio.

KRSG 65M - Kresge Lab: Text, Music, and Performance (2)

Students pursue collaborative or individual projects in the relationship between text, music, and performance, in pairs or groups. Areas explored include practical introductions to prosody and poetics, musical forms, text-setting, and theories of performance and reception.

KRSG 65W - Kresge Lab: Creative Writing (2)

A course of guidance and exercises to assist in developing independent writing projects, and a group setting for critique and feedback. Students do in-class and out-of-class writing assignments; read and discuss texts; and work to develop a final project.

KRSG 67 - Transformative Justice Seminar (3)

Examines the principles and processes of restorative justice juxtaposed to current practices in the judicial and educational systems of contemporary society. Students study leading restorative justice practices and their implication for individual and community transformation. Students learn to facilitate the

restorative justice process restorative circles, and have the opportunity to practice them in real time. Enrollment is by instructor consent and is restricted to frosh, sophomores, and juniors.

KRSG 68 - Transformative Communication (2)

Based on Nonviolent Communication (NVC), this experiential course offers skills in intra- and inter-personal conflict transformation by aligning with core values; understanding what motivates self and others; cultivating compassion, even under difficult circumstances; and bringing greater peace into our world.

KRSG 69 - Practical Application of Restorative Practices (2)

This second seminar supports students in deepening and fine-tuning their Restorative Circle facilitation along with exploring the question What are the components of a restorative life? Students participate in the Kresge College Restorative Justice Initiative, and, during the fall quarter, offer Restorative Circles to student groups in conflict.

Prerequisite: Prerequisite(s): KRSG 67. Enrollment is restricted to sophomores, juniors, and seniors.

KRSG 71 - The World Cafe: The Art of Hosting Conversations That Matter (2)

Examines the principles, practices, and art of hosting conversations derived from the work of Juanita Brown, David Isaacs, and the World Cafe community. Students gain experience with group facilitation, meeting design, strategic questioning, harvesting collective intelligence, graphic recording, intergenerational collaboration, and participatory action-research.

KRSG 72 - Collaborative Learning: Transitioning to Sustainability and Justice (2)

Collaborative learning in service of transitioning from an industrial growth society to a participatory, democratic, and sustainable society. Students engage with ongoing sustainability and justice projects and develop leadership skills in personal productivity, project management, communications, and facilitation. (Formerly Collaborative Learning: The Great Turning.)

KRSG 73 - Collaborative Learning: Sustainable Communities (2)

Collaborative learning in service of building thriving, just, and sustainable communities locally and globally. Students engage with ongoing sustainability and justice projects and develop skills in leadership, personal productivity, project management, communications, and facilitation.

KRSG 74 - Collaborative Learning: Permaculture Skills (2)

Collaborative learning in service of fostering community resilience in response to environmental and social crisis. Students engage with ongoing sustainability and justice projects and develop advanced skills in leadership, personal productivity, project management, communications, and facilitation.

KRSG 75 - Sustainable Food Systems (5)

Introduces students to fundamental food-system issues and opportunities. Topics include: hunger, environmental sustainability, race and gender, food and agricultural policy, local food systems, gardening and farming models, social movements, and approaches for analysis and change.

KRSG 76 - Social Documentary Photography (5)

History of social documentary photography with its practice. Includes analysis of historical and contemporary images from social documentary work; camera, darkroom, and digital skill development; an individual student documentary project; and collective project discussion.

Prerequisite: Enrollment is restricted to Kresge College members.

KRSG 77 - Food Memoir (2)

Workshop in writing memoir that connects to issues of multiculturalism, gender, and environment. Designed to hone skills in creative writing through stories that students will unify into a larger memoir.

Prerequisite: Enrollment is restricted to Kresge and College Eight members or by permission of instructor.

KRSG 78 - Social and Environmental Justice Activism and the Right Livelihood Award Foundation (2)

Introduces contemporary activism on environmentalism and human rights, emphasizing the work of Laureates of the Right Livelihood Award (known internationally as the Alternative Nobel Prize) and the Right Livelihood College, whose North American campus is Kresge College.

KRSG 85S - Critical Writing Practicum: Subject and System (5)

Writing practicum. Students investigate social epistemology and ontology—the "how do we know" and "what do we mean" questions—surrounding the idea of systems and subjects. Questions might include, but are not limited to: What systems in society do we identify when we identify systemic racism, or other systemic bias? Is "society" an object that we can know, and if so, does our knowledge of it privileges systems and structures? Students consider these concepts and questions as broad starting points for weekly reflective and analytical writing, with a concentration on research-driven non-fiction writing.

Prerequisite: Enrollment restricted to students in the College Scholars Program.

KRSG 90C - Collaborative Approaches to Research (5)

Critical engagement of current research methodology in the humanities and arts. Coursework consists primarily of a collaborative research project that requires each student to synthesize information and sources in topics both familiar and unfamiliar. The specific methodologies presented vary by instructor across two to three disciplines, possibly including literature, history, the arts, and cultural studies. Enrollment is restricted to first-year Challenge Program participants from

Stevenson College, Merrill College, Porter College, and Kresge College.

KRSG 99 - Tutorial (5)

A program of directed study arranged between a first-year or sophomore student and a Kresge faculty member. Students submit petition to sponsoring agency.

KRSG 99F - Independent Study (2)

A program of directed study arranged between a student and a Kresge faculty member. Class time is less proportional to credit given. Students submit petition to sponsoring agency.

KRSG 99G - Independent Study (3)

A program of directed study arranged between a student and a Kresge faculty member. Students submit petition to sponsoring agency.

Upper-Division**KRSG 100 - University Learning with Intention and Purpose (2)**

Students learn practical ways of maximizing the resources of a public education and research institution. Students collaborate across disciplines, broaden impacts of higher learning, and develop strategies for effective interaction with faculty and the broader professional communities to which they aspire.

Prerequisite: Enrollment is restricted to sophomores, juniors, and seniors.

KRSG 102 - Internship Course: Services for Transfer And Reentry Students (2)

Students learn models for increased accessibility and efficacy in higher education, and prepare to lead through those models within transfer student- and reentry student-focused communities. Engage in dialogue about university policy, identify structural barriers faced by minoritized and other disadvantaged communities when pursuing higher education, and collaboratively design projects to address them. Implement and lead civic-engagement activities and reflect on personal experience and knowledge to meet student-defined goals. With additional guidance from the STARS director and STARS staff, interns create plans and help to implement projects that reflect the learning of the course.

KRSG 105 - STARS Intensive Internship Curriculum (5)

Students learn models for increased accessibility and efficacy in higher education, and implement leadership through those models within transfer student- and reentry student-focused communities. Engage in dialogue about university policy, identify structural barriers faced by minoritized and other disadvantaged communities when pursuing higher education, and collaboratively design projects to address them. Implement and lead civic-engagement activities and reflect on personal experience and knowledge to meet student-defined goals. With additional guidance from the STARS director and STARS staff, interns create plans and implement projects that reflect the learning of the course.

KRSG 161 - Permaculture and Whole Systems Design (5)

Focuses on concepts, principles, and practices of permaculture and whole systems design. Permaculture education is transdisciplinary and provides practical experience with design, ecological horticulture, regional planning, natural building, architecture, appropriate technology, aquaponics, animal husbandry, ecopsychology, and community resilience. Enrollment by application.

KRSG 171 - Kresge Challenge Seminar (5)

For first-year students, by invitation only. This class is part of the Challenge Program which provides high-achieving students with the opportunity to participate in a rigorous program emphasizing individual attention and dynamic interaction with UCSC faculty and academically motivated peers in classes, social settings, and collaborative research projects. Enrollment restricted to Kresge, Merrill, and Stevenson students enrolled in the College Challenge Programs.

KRSG 172 - Collaborative Learning: The Great Turning (5)

Collaborative learning in service of transitioning from industrial growth society to a life-sustaining society. Students deepen their connection with nature, themselves, and community through guest lectures, intergenerational dialogue to discover collective and wise action, and engagement with long-term projects.

Prerequisite: Enrollment is restricted to sophomores, juniors, and seniors.

KRSG 173 - Collaborative Learning: Sustainable Communities (5)

Collaborative learning in service of building thriving, just, and sustainable communities locally and globally. Learn about Ecovillages and reclaiming the commons while also discovering collective and wise action through guest lectures, intergenerational dialogue, and engagement with long-term projects.

Prerequisite: Enrollment is restricted to sophomores, juniors, and seniors.

KRSG 174 - Collaborative Learning: Permaculture Skills (5)

Collaborative learning in service of fostering community resilience in response to peak oil. Practice hands-on skills with permaculture and transition towns while also discovering collective and wise action through guest lectures, intergenerational dialogue, and engagement with long-term projects.

Prerequisite: Enrollment is restricted to sophomores, juniors, and seniors.

KRSG 192 - Directed Student Teaching (5)

Teaching of a lower-division seminar under Kresge faculty supervision. (See KRSG 42.) Prerequisite(s): upper-division standing in Kresge, a proposal supported by a Kresge faculty member willing to supervise, and college approval.

KRSG 193 - Field Study (5)

Supervised off-campus study conducted under the immediate and direct guidance of a Kresge faculty supervisor. To be used primarily by upper-division students doing part-time, off-campus study. Prerequisite(s): approval of student's adviser and the college.

KRSG 194 - Group Tutorial (5)

A program of independent study arranged between a group of students and a Kresge faculty member. Students submit petition to sponsoring agency.

KRSG 195 - Senior Thesis (5)

Senior thesis or project for student doing individual major program. May be repeated twice for credit. Prerequisite(s): permission of sponsoring committee and college approval.

KRSG 198 - Independent Field Study (5)

Provides for college-sponsored individual study programs off campus, for which Kresge faculty supervision is not in person (e.g., supervision is by correspondence.) Prerequisite(s): approval of the student's faculty sponsor and college approval.

KRSG 199 - Tutorial (5)

A program of individual study arranged between an upper-division student and a Kresge faculty member. Students submit petition to sponsoring agency.

KRSG 199F - Tutorial (2)

Tutorial

LAAD - LANGUAGES**Lower-Division****LAAD 99 - Tutorial (5)**

Students submit petition to sponsoring agency.

LAAD 99F - Tutorial (2)

Students submit petition to sponsoring agency.

Upper-Division**LAAD 199 - Tutorial (5)**

Students submit petition to sponsoring agency.

LAAD 199F - Tutorial (2)

Students submit petition to sponsoring agency.

Graduate**LAAD 210 - Oral Communication in the U.S. Classroom: Strategies for International T.A.s (2)**

Seminar for international graduate students who speak English as a second or foreign language. Focuses on oral competency

and serves to qualify students as graduate teaching assistants in UCSC classrooms or laboratories.

Prerequisite: Enrollment is restricted to international graduate students; language assessment administered by the Graduate Division.

LALS - LATIN AMERICAN AND LATINO STUDIES

Lower-Division

LALS 1 - Introduction to Latin American and Latino Studies (5)

Interdisciplinary introduction presenting the elements for studying Latin American politics and economics, culture, and society as well as the dynamics of Latino communities in the U.S. Special attention paid to issues of colonialism, human rights, U.S. foreign policy toward Latin America, racism, capitalist globalization, migration, to emerging political and economic shifts in the Americas, and to new local and transnational efforts for social change on the part of Latin America's peoples and Latinos in the U.S.

LALS 5 - Introduction to Human Rights and Social Justice (5)

Introduces human rights as a way to study social justice. Students gain an understanding of interdisciplinary approaches to human rights as a theory, legally, and as a basis for global social movements.

LALS 15 - Truth, Justice, and Statistics (5)

Provides statistical methodological training and skills through the examination of social and cultural manifestations of truth as a tool to serve social justice efforts for Latinx and other minoritized students in the education setting.

LALS 20 - Latino Politics (5)

Offers a domestic (U.S.) and transnational approach to Latino politics, focusing on the five largest Latino groups: Mexicans, Puerto Ricans, Cubans, Salvadorans, and Guatemalans. Issues addressed include Latino electoral participation, Latino public opinion, migrant political incorporation, and transnationalism among others.

LALS 30 - Social Movements in Latin America (5)

Examines contemporary social movements in Latin America, especially those that arose from popular response to different forms of social exclusion and to authoritarian political systems. Explores a variety of popular movements, their successes and setbacks, including rural and urban uprisings, native nations and their descendants, women, labor, human rights, and transnational movements.

LALS 32 - Citizens, Denizens, Aliens (5)

Explores theories and practices of citizenship with a focus on how institutions, such as the immigration apparatus, school, and prison, produce and shape inclusion, marginalization, exclusion, and mobility and how social actors envision and enact home and belonging.

LALS 40 - Latinos and Labor (5)

Explores the historical, social, economic, and political dynamics of inequality, stratification, and segmentation that shape the occupational pathways and workplace conditions of Latinos in the United States. Students learn about the structures, policies, and ideologies that influence Latinos' working lives as well as how individuals experience their work in a variety of sectors.

LALS 45 - Intersections of Race, Class, and Gender (5)

Introduces theories of race, class, and gender which shape understandings about racial/ethnic issues in the United States. With particular attention to the experiences of U.S. racial/ethnic groups, including Latinas/os, African Americans, Asian Americans, and Native Americans, this course draws from interdisciplinary research to address how race, class, and gender are also crosscutting dynamics.

LALS 50 - Transnational Feminist Organizing in the Americas (5)

Explores key aspects of transnational feminist organizing in the Americas, including transnational feminist theories and feminist activism in Latin America and the Caribbean. Discusses how women from throughout the Americas region organize politically and socially across gender, race, ethnicity, sexuality, and nationality.

LALS 55 - AIDS Across the Americas (5)

Compares the response to AIDS in the United States and Latin America, with special attention to migration, human rights, activism, stigma, gender, and sexuality. Students develop a conceptual foundation to conduct a people-centered approach and cultural analysis of AIDS.

LALS 60 - Latin American Childhoods (5)

Introduces research on childhood in contemporary Latin America. Explores discourses about Latin American children, the regional institutions shaping children's lives, and how children experience and negotiate these larger social forces.

LALS 65 - Religion and Revolution in Latin America (5)

Examines the religious beliefs and practices surrounding the revolutionary movements for social change in Latin America with a particular focus on liberation theology.

LALS 70 - Cinema and Social Change in Cuba (5)

Examines selected feature-length films and documentaries produced after the Revolution of 1959 as a venue to study social change in Cuba. Cinema is used as artifact to document and critique social change. Topics include: the role of art and artist in Revolution, literacy campaign, changing gender relations, dissident sexualities, racial politics, and others.

LALS 75 - Art and Social Change in Latin America: Diego Rivera (5)

Explores the works of Diego Rivera, other Mexican muralists, and the Latin American cultural movements that developed to address relevant social and political issues.

LALS 79 - Hip Hop History/Historia Hip Hop (5)

Exploration of key themes in Latin American history through the medium of hip hop. Students analyze prevalent historical patterns that speak to shared experiences across the Americas. Course content is divided into weekly modules that move thematically through topics including struggles for social and political citizenship, structural mechanisms of exclusion, and anti-imperialist activism. Also includes reading primary historical documents and engaging in textual analysis of both archival and contemporary texts. Readings equip students to critically interpret elements of hip-hop culture from contemporary Latin America and the Caribbean including MCing, graffiti, and hip hop as the production of knowledge.

LALS 79S - Hip Hop Historia (5)

Taught in Spanish. Exploration of key themes in Latin American history through the medium of hip hop. Students analyze prevalent historical patterns that speak to shared experiences across the Americas. Course content is divided into weekly modules that move thematically through topics including struggles for social and political citizenship, structural mechanisms of exclusion, and anti-imperialist activism. Also includes reading primary historical documents and engaging in textual analysis of both archival and contemporary texts. Readings equip students to critically interpret elements of hip-hop culture from contemporary Latin America and the Caribbean including MCing, graffiti, and hip hop as the production of knowledge.

LALS 80D - Political Change in Mexico (5)

Reviews broad trends in contemporary Mexican politics against the backdrop of long-term historical, social, and economic change throughout the 20th century, analyzing how power is both wielded from above and created from below. The course covers national politics, grassroots movements for social change and democratization, environmental challenges, indigenous movements, the media, and the politics of immigration and North American integration.

LALS 80F - Latinos in the U.S.: A Comparative Perspective (5)

Analyzes the Latino experience in the U.S. with a special focus on strategies for economic and social empowerment. Stresses the multiplicity of the U.S. Latino community, drawing comparative lessons from Cuban-American, Puerto Rican, Chicano/Mexicano, and Central American patterns of economic participation and political mobilization.

LALS 80H - Comparative Latina/o Histories (5)

Designed to survey recent works in the field of Latina and Latino histories, with particular emphasis on historiographical approaches and topics in the field. Readings are chosen to expose a selection of the varied histories and cultures of Latina/os in the U.S., and focus primarily on Mexicans, Puerto Ricans, and Cubans.

LALS 80J - Race, Nation, and War (5)

Evaluates the relationship between processes of racial formation, war, and nationalism in Latin America. Case studies range from the wars of independence to more recent forms of

transnational violence. Students engage historical and anthropological perspectives and critiques of modernity.

LALS 80P - Environment and Society in Latin America (5)

Examines the implications of environmental degradation and resource extraction for economic growth and social inequality in Latin America. Course focuses on the connections between race, ethnicity, power, poverty, and environmental problems.

LALS 80S - Sexualities and Genders in Latin American and Latina/o Studies (5)

Introduction to issues and themes surrounding sexualities and genders within Latin American and Latina/o studies. Provides background in the basic theoretical and historical frameworks of gender and its relationship to sexuality. In addition to cross-border perspectives, course also examines how gender and sexuality are structured and experienced through other social categories.

LALS 80X - Central American Peoples and Cultures (5)

Examines contemporary societies and peoples of Central America considering how, in recent decades, media, history, war, cultural production, and migration have shaped Guatemala, Honduras, El Salvador, Nicaragua, and Costa Rica both as individual nations and as a region.

LALS 90 - Contemporary Brazil (5)

Introduces issues affecting contemporary Brazilian society and culture, such as the legacy of slavery and persisting social, racial, and gender inequities. Analyses of how different representations of Brazil sustain distinctive national projects, which, in turn, attribute specific meanings to blackness, whiteness, masculinity, femininity, and upper- and lower-class identities.

LALS 94X - Mother Earth, Capitalism, and Crises (5)

With a focus on the Americas, this course introduces students into the debates about the causes and solutions to the twinned crisis of global climate change and rising inequality.

LALS 95 - Undergraduate Research Seminar (2)

Seminar for undergraduates participating in the Cultivamos Excelencia program supporting the development of students as researchers and active participants in academic communities; including lectures on disciplinary methods by participating faculty, work-in-progress sessions for mentors and student researchers, and workshops on formulating research questions, developing a research plan, writing a research paper, and professional development. Enrollment is by instructor permission.

Upper-Division**LALS 100 - Concepts and Theories in Latin American and Latina/o Studies (5)**

Interdisciplinary exploration of transnational migrations; social inequalities; collective action and social movements; and cultural productions, products, or imaginaries. Examines how

transnational migration and hemispheric integration are transforming Latin American studies and Chicana/o-Latina/o studies. Explores the influence of neoliberalism and globalization, especially the intersection of critical analysis and social-justice praxis. Completion of course 1 highly recommended.

Prerequisite: Enrollment is restricted to sophomores, juniors, and seniors.

LALS 100A - Social Science Analytics (5)

Compares diverse analytical strategies and builds practical research skills in the field of Latin American and Latino studies. Two-credit LALS 100L writing lab highly recommended.

Prerequisite: Prerequisite(s): LALS 100 and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to sophomore, junior, and senior Latin American and Latino studies majors, minors, and combined majors or by permission.

LALS 100B - Cultural Theory in the Americas (5)

Focuses on transnational, regional, and local features of Latina/o and Latin American cultural production and artistic expression: how culture is shaped by historical, social, and political forces; how cultural and artistic practices shape the social world; and how culture is produced in an interconnected, postindustrial, and globalized economy.

Prerequisite: Prerequisite(s): LALS 100 and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to sophomore, junior, and senior Latin American and Latino studies majors, minors, and combined majors.

LALS 112 - Immigration and Assimilation (5)

Examines immigration to U.S. from colonial era to present with special emphasis on issues of citizenship, social identities, and social membership.

LALS 115 - Mexico-United States Migration (5)

Overview of Mexico-United States migration in historical and contemporary context. Focuses on Mexican experiences of racialization, deportability, second-class citizenship, and transnationalism--the cross-border networks, institutions, activities, loyalties, and identities by which Mexican migrants orchestrate their lives across international borders.

Prerequisite: Enrollment is restricted to sophomores, juniors and seniors.

LALS 122 - Media and Nationalism (5)

Evaluates the links between media and the production of national identities in Latin America. Focuses on theories of nationalism, media, and globalization to examine the production of national histories and representations.

Prerequisite: Enrollment is restricted to juniors and seniors.

LALS 124 - Brazilian Cinema (5)

Surveys films by and/or about women from Brazil, drawing a picture of contemporary Brazilian cinema through the angle of gender in its articulation with sexuality, race, class, ethnicity, national identity, and other key concepts, while offering a visual and critical introduction to Brazilian culture.

LALS 126 - Digit@l Americ@s/Digit@l Latin@s (5)

Examines how social media reconfigures daily lives, cultures, and economies and explores how recent leaps in communication technologies breed digital divides and new forms of activism.

LALS 127 - Genero, Nacion Y Modernidad En El Cine (5)

Taught in Spanish. Examines the relationship between cinema, gender, the nation, and modernity. Focusing on films by key women filmmakers in Latino and Latin America, the seminar examines their engagement with identity, cultural imaginaries, coloniality, sexuality, and gender.

Prerequisite: Enrollment is restricted to Latin American and Latino studies majors, minors and combined majors.

LALS 128 - Latino Media in the U.S (5)

Explores the history and practice of Latino media in the U.S. with an emphasis on work created by, for, with, and about Latino constituencies. Course highlights the role that media plays in struggles for social change, political enfranchisement, creative self-expression, and cultural development. Course content varies with instructor.

LALS 129 - America Latina: Cine, Dictadura y Memoria (5)

Taught in Spanish. Analyzes and compares the rise of authoritarian regimes throughout Latin America in the 20th century through selected films and documentaries. Themes include U.S. foreign policy toward the region, ethnic cleansing, neoliberalism, and memory/resistance/reconciliation through artistic representations.

LALS 130 - Expresiones cuirs de Genero y Sexualidad en el cine Latinoamericano (5)

Examines cinematic manifestations of dissident sexualities, as well as dissident expressions of gender and family in Latin American culture. Taught in Spanish.

Prerequisite: Enrollment is restricted to juniors and seniors.

LALS 131 - Latino Literatures: Assimilation and Assimilability (5)

Explores assimilation and assimilability in the United States, especially as related to the education and languages of Latinos, via literary forms, such as the memoir, novel, essay, short fiction, film, and/or poetry. (Meets the methods requirement in Latin America and Latino studies.)

LALS 133 - Latina/o Art and Representation (5)

Focus on art forms and visual representations of Latina/os in the United States. Emphasis on visual art created by artists

associated with the Chicano/o movement and the Central American diaspora. Topics include cultural identity, murals, public art, and fine art.

LALS 135 - El Salvador: Expresiones Culturales (5)

Course taught in Spanish. Focuses on El Salvador, with attention to cultural expressions and representations, literature, historical perspectives, and contemporary societies.

LALS 136 - Tourism, Culture, and Identity (5)

Interdisciplinary study of tourism in Latin America and its interconnections with culture, power, and identity. Examines contemporary trends of tourism (ethnic tourism, diaspora tourism, sex tourism, and favela tours) and explores how regional, national, and transnational identities shape and are shaped by tourism.

Prerequisite: Enrollment is restricted to juniors and seniors.

LALS 137 - Speculative Fiction and Chicanafuturism (5)

Explores the intersection of race, gender, science, technology, the environment, and the future in speculative fiction by and about Latinxs, migrants, and people of color.

LALS 143 - Race and Ethnicity (5)

Race and ethnicity have been—and continue to be—powerful forces shaping the U.S. experience. This course examines a range of conceptual approaches and monographic studies grounded in the history of the U.S. The readings provide various criteria for studying and understanding these phenomena. The course problematizes race by asking what the readings tell us about race-making and the reproduction of racial ideologies in specific historical contexts. Similarly, ethnicity is treated as a historically specific social construct. (Meets the methods requirement in Latin America and Latino studies.)

LALS 143J - Global Political Economy (5)

Analyzes the global, social, economic, and political forces that shape transnational, national, and regional societal formations and consequently the entire environment for social change. Examines the evolution of revolutionary struggle and its origins within and impact upon the evolving capitalist system.

LALS 144 - Mexicana/Chicana Histories (5)

Explores current historical and theoretical writings on the lived experiences of Chicanas and Mexicana women in U.S. history. Themes include domination/resistance politics, (re)presentations, contestation, social reproduction, identity and difference. Meets the methods requirement in Latin America and Latino studies.

LALS 145 - Grassroots Social Change in Latin America (5)

Focuses on the analysis of collective action by underrepresented groups in Latin America. Concepts and issues include political participation and impact, gender, ethnicity and race, class, the environment, religion, non-governmental organizations, and social capital.

Prerequisite: Prerequisite(s): any two Latin American and Latino studies courses or permission of instructor; open to graduate students.

LALS 147 - Latin American Identity: The Struggle for Authenticity (5)

Nineteenth-century Latin America has been described as "countries in search for nationhood." Intellectual elites sought to create that sense of identity for their new countries while struggling to appear simultaneously modern and "authentic." This course examines 19th-century Latin American history starting with wars of independence and ending with the growing threat of imperialism from the United States. Course focuses on the emerging concepts of nation and identity and the ways in which women, marginalized people, and racialized people resisted or participated in these new constructions.

LALS 149 - Whiteness in Latin America (5)

Challenges the racial hierarchy of knowledge production by making whiteness into a central object of study and scrutinizing the power that stems from its alleged invisibility. Studies whiteness in three specific Latin American countries and vis-a-vis their respective dominant national discourses: Mexico and its narratives of mestizaje, Brazil and the myth of racial democracy, and Argentina and its discourses of Europeaness. Also examines how whiteness and its "Others" (I.e. blackness, indigeneity, and Asianness) have been imagined, embodied, avoided, and embraced in these three Latin American countries.

LALS 150 - Afro-Latinos/as: Social, Cultural, and Political Dimensions (5)

Explores the lives of African descendants in the Americas, including the Caribbean. Students learn about the settlement patterns of Afro-Latinos/as and Afro-Latin Americans in the region and the ways in which African descendants negotiate their multiple identities and broaden racial frameworks in the United States and Latin America.

LALS 151 - Race & Mobility (5)

Focuses on the intersection between mobility and race, examining both how mobility is racially informed and how differential mobilities inform the construction of racial identities, the production of racial processes, and the representation of racialized spaces. Examining different facets of mobility—movement, meaning, and practice—course topics include: the mutual constitution between mobility and racial identities (blackness, whiteness, Latinidad, and indigeneity); white control over the mobility of "others;" bodily movements (dancing, walking) as sites of resistance and policing; prototypical whiteness and the surveillance of non-white mobile bodies border crossing; and the intersections between racial mobility politics and gender and class dynamics.

LALS 152 - Consumer Cultures Between the Americas (5)

Examines the circuits of media, commodities, and migration connecting the Americas in an age of globalization. Issues of states, transnational markets, social relations, and cultural representations addressed. Relationship between consumption, nationalism, and globalization is considered critically.

LALS 154 - Juventud in Latin America (5)

Introduces students to the study of youth in Latin America through discussions about theoretical approaches to youth in Latin America. Students examine the challenges, obstacles, and experiences of exclusion faced by young people in the region and learn about Latin American youth through a variety of topics, including poverty, education, culture, social movements, and COVID-19.

LALS 155 - Latin American and Latino Youth Movements (5)

Examines the histories, structures, and practices of Latin American and Latino youth movements. Analyzes the patterns, themes, and differences of social movements using primary documents. Addresses the dynamics of age, generation, race, ethnicity, and nation. Uses youth activism to explore questions relevant to the study of contemporary social movements in the Americas.

LALS 156 - Human Rights and Transitional Justice in the Americas (5)

Provides students with an introduction to the emerging scholarly field of transitional justice. Examines transitional justice in a broad sense and through elected case studies.

Prerequisite: Prerequisite(s): LALS 1. Enrollment is restricted to junior and senior Latin American and Latino studies majors, minors, and combined majors.

LALS 157 - Revoluciones Sociales (5)

Taught in Spanish. Examines major social upheavals in Latin America since 1900, exploring revolution as a distinctive form of social conflict and change. Analyzes political, economic, social, and cultural conditions that gave rise to, and linked, revolutions across the Americas.

LALS 158 - Latin American Political Economy (5)

Explores and applies basic tools of Latin American political economy to map the evolution of the region's main patterns of economic growth and accompanying social structures across past centuries. Reviews the effects of neoliberal capitalist globalization on contemporary Latin America, resistance to destructive consequences, and the nature of emerging alternatives.

LALS 163 - The Amazon: Cultures and Perspectives (5)

Examines the peoples and cultures of lowland South America, particularly the historical, economic, and environmental processes that have shaped the Amazonian region. Students acquire tools to critically approach traditional representations of Amazonian cultures and understand their relevance to global issues.

LALS 165 - Contemporary Peru (5)

Explores contemporary issues facing Peru by addressing the formation of the state and the country's troubled history with political and state violence. Students learn about Peru's multicultural/racial population and about ongoing conflicts and hopes for the country today.

LALS 168 - Inter-American Relations (5)

Examines the history of various forms of connection between people, governments, cultures, and social movements across the Americas. From military intervention to transnational anti-imperialist agendas to contemporary artistic collaboration, many forms of foreign relations have shaped the American hemisphere.

LALS 169 - South America: History, Society, and Culture (5)

Examines the southernmost region of South America, commonly referred to as the Southern Cone, exploring the historical trajectories of Argentina, Chile, Paraguay, Uruguay, and southern Brazil, from independence through the end of the 20th century.

LALS 170 - Indigenous Struggles in the Americas (5)

Focuses on the way Natives of First Peoples have interacted voluntarily and involuntarily with nonindigenous cultures. Examines their perspectives, thoughts, frustrations, and successes. Touches on land issues and examines the way current indigenous cultures of Latin America face and adapt to social change. Focuses mainly on the Andes, lowland Amazon, Mesoamerica, and other areas.

LALS 171 - Brazil in Black and White (5)

Taught in Portuguese. Examines blackness and whiteness in Brazil through the lens of the intersectionality of race, gender, and class identities. Topics include: national narratives of racial democracy, racism, black activism, and the emerging studies of whiteness in Brazil.

LALS 172 - Visualizing Human Rights (5)

Explores how visual artists take up the subject of human rights in response to urgent challenges facing Latina/o and Latin American communities across the Americas. Examines the imprint of film and media arts reshaping human-rights discourse. Considers persistent themes in Latina/o representation, including colonialism and state terrorism; self-representation and the rights of collectives (racial, ethnic, and sexual groups); social and economic rights. (Meets the methods requirement in Latin America and Latino studies.)

LALS 175 - Migration, Gender, and Health (5)

Through an interdisciplinary, cross-border approach, examines complex nature of Latino health in relation to migration and how women and men experience health problems differently. Examines how health problems are created by economic and social conditions, how migrants experience access to care, and how agencies can design culturally sensitive programs.

LALS 178 - Gender, Transnationalism, and Globalization (5)

Focuses on the impact of globalization and transnationalism on gender relations in the Americas. Examines gender and power in the context of neoliberalism, modernity, the nation, social movements, and activism. Explores local and transnational constructions of gender, and the intersection of gender with race, ethnicity, class, and sexuality.

LALS 180 - Borders: Real and Imagined (5)

Situates The Border historically and within the context of U.S. imperialism. Examines the formalization of political borders, methods of enforcement, and intra-group conflicts. Examines the varied experiences of colonialism and immigration between Mexicans, Puerto Ricans, Native Americans, and Cubans. Explores how the tools of The Border and Borderlands are being used to untangle the roles of race prejudice and sexual and gender discrimination. (Meets the methods requirement in Latin America and Latino studies.)

LALS 186 - Field Research Methods (5)

Introduction to field research methods that consider theory, methodological challenges, and epistemology in conducting research. Explains the research process, including designing research questions, interview instruments, concepts maps, and methods of data collection, and data analysis. (Meets the methods requirement in Latin America and Latino studies.)

Prerequisite: Prerequisite(s): LALS 100; and LALS 100A or LALS 100W. Enrollment is restricted to junior and senior Latin American and Latino studies majors, minors, and combined majors and Sociology majors.

LALS 187F - Human Rights Investigations Lab (2)

Weekly seminar with an applied lab where students are trained in the fundamentals of social media literacy skills and analysis, gain an understanding of the context for socio-political conflicts in the Americas region, and consider the ethics of engaging in human rights media research using open source. Students learn how to locate, verify, and analyze digital media for human rights cases using open source investigation tools. Various assignments focus on the region of the Americas. Students prepare and produce human rights social media reports. Enrollment is by permission of the instructor.

LALS 187L - Human Rights Investigations Lab (5)

Weekly seminar with an applied lab where students are trained in the fundamentals of social media literacy skills and analysis, gain an understanding of the context for socio-political conflicts in the Americas region, and the consider the ethics of engaging in human rights media research using open source. Students will learn how to locate, verify, and analyze digital media for human rights cases using open source investigation tools. Various assignments focus on the region of the Americas. Students prepare and produce human rights social media reports. Enrollment is by permission of the instructor.

LALS 190 - Internship (5)

Internships with campus or community organizations sponsored and evaluated by a Latin American and Latino studies faculty member. Students write an analytical paper or produce another major work agreed upon by student, faculty supervisor, and internship sponsor; sponsor must also provide review of experience. Students submit petition to sponsoring agency.

LALS 190F - Internship (2)

Internships with campus or community organizations sponsored and evaluated by a faculty member from Latin American and Latino studies. Students write a short (8-page) descriptive paper or produce another work agreed upon by student and faculty supervisor. Students submit petition to sponsoring agency.

LALS 194A - Immigrant Storytelling (5)

Examines first-person narratives by migrants, paying close attention to storytelling as a strategy for fomenting cultural, social, and political change. In addition to reading literary and visual texts, student complete a final project based on original research.

Prerequisite: Prerequisite(s): LALS 100, and LALS 100A, and previous or concurrent enrollment in LALS 100B. Enrollment is restricted to junior and senior Latin American and Latino studies majors and combined majors.

LALS 194B - Global Migration and Displacement (5)

Examines the global history of migrating people, things, and ideas. Focuses primarily on case studies of mass migration and displacement in 19th and 20th centuries. Students analyze processes of migration in the Americas within a broader global context.

Prerequisite: Prerequisite(s): LALS 100, and LALS 100A, and previous or concurrent enrollment in LALS 100B. Enrollment is restricted to junior and senior Latin American and Latino studies majors and combined majors.

LALS 194C - Criminalizing the Poor (5)

Examines neoliberal discourses related to poverty that have become more critical of the poor over time, including reforms to social welfare, criminal justice, and immigration, and the ways in which the poor struggle to survive and contest neoliberalism.

Prerequisite: Enrollment is restricted to junior and senior Latin American and Latino studies majors and minors; and combined majors with global economics, sociology, literature, and politics.

LALS 194E - Unfree Migrations (5)

Examines forced migrations to and within the Americas prior to the 20th century, with a focus on African and indigenous slave trades, indentured servitude, convict labor, and contract labor. Students address the implications and memories of those migrations today.

Prerequisite: Prerequisite(s): LALS 100, and LALS 100A, and previous or concurrent enrollment in LALS 100B. Enrollment is restricted to junior and senior Latin American and Latino studies majors and combined majors.

LALS 194G - Chile: Social and Political Change (5)

Taught in Spanish. Analysis of Chilean politics and society from the election of Salvador Allende in 1970 to the present. Particular emphasis is given to understanding the different forces, internal as well as external, that broke the Chilean

tradition of democratic rule in 1973, and to the current configuration.

Prerequisite: Enrollment is restricted to junior and senior Latin American and Latino studies majors, minors, and combined majors.

LALS 194H - Central America and the United States (5)

This senior seminar focuses on the connections between Central America and the United States. Covers Central American history, the political and economic relations between the isthmus and the United States, and Central American media and literature. (Formerly Central American Political Relations with the U.S.)

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to junior and senior Latin American and Latino studies majors, minors, and combined majors.

LALS 194M - Twentieth-Century Revolutions (5)

Treatment of 20th-century Latin American revolutions from Zapata to the Zapatistas. Focuses on the causes and consequences of revolutions rather than on their narrative histories.

Prerequisite: Enrollment is restricted to junior and senior Latin American and Latino studies majors, minors, and combined majors.

LALS 194Q - Globalization in the Americas (5)

Introduces multiple dimensions of globalization by reviewing key theories and frameworks in order to understand development, social inequalities, trade agreements, multilateral institutions, and the future of globalization studies.

Prerequisite: Enrollment is restricted to junior, and senior Latin American and Latino studies majors, minors, and combined majors.

LALS 194R - Violencia Cotidiana en las Americas (5)

Senior seminar taught in Spanish. Engages a critical study of violence, social relations, and everyday life in contemporary Latin America. Focuses on the relationship between narratives and acts of violence, and the constitution and social effects of these representations. Requires proficiency in Spanish (written and spoken), and advanced reading knowledge of Spanish.

Prerequisite: Enrollment is restricted to junior and senior Latin American and Latino studies majors, minors, and combined majors.

LALS 194T - Youth and Citizenship (5)

Explores multiple and contested meanings of youth and citizenship; how youth, civic, and political identities are imagined, produced and negotiated in social and cultural locations; and how different versions of Latina/o youth citizenship are promoted and articulated by social and political institutions.

Prerequisite: Enrollment is restricted to junior and senior Latin American and Latino studies majors, minors, and combined majors.

LALS 194U - Political Violence in Mexico (5)

Focuses on rural and urban case studies of state repression in post-revolutionary Mexico. Examines how political violence was a preferred method of governance by Mexico's autocratic rulers throughout the 20th century.

Prerequisite: Enrollment is restricted to juniors and seniors.

LALS 194V - Comparative Migration Histories in the Americas (5)

Traces major historical patterns of migration and related processes in the Americas over the past two centuries. Covers the social, cultural, political, and economic factors that drive and shape the movements of people and considers the ways migration has impacted the sending, transit, and receiving societies. Over the quarter, students come to understand major historical forces of migration that inform our contemporary world, including citizenship, urbanization, identity formations, globalization, and neoliberalism.

Prerequisite: Enrollment is restricted to seniors.

LALS 194X - Extractivism and Socio-Environmental Conflicts in the Americas (5)

Explores, in-depth, how local communities, transnational capital, and state participate in conflicts anchored in extractive sectors, for example, mining, agro-exports, and so on. Through digital-based, case-study research, students identify and explore the logics of action, strategic interests, and the rhetoric of the principal protagonists in socio-ecological conflicts.

Prerequisite: Enrollment is restricted to juniors and seniors.

LALS 195B - Senior Project (5)

Senior thesis writing under direction of major adviser. Students submit petition to sponsoring agency.

LALS 195C - Senior Project (5)

Senior thesis writing under direction of major adviser. Students submit petition to sponsoring agency.

LALS 198 - Field Study (5)

Off-campus study in Latin America, the Caribbean, or nonlocal Spanish-speaking community in the U.S. Nature of proposed study/project to be discussed with sponsoring instructor(s) before undertaking field study; credit toward major (maximum of three courses per quarter) conferred upon completion of all stipulated requirements. Students submit petition to sponsoring agency.

LALS 198F - Independent Field Study (2)

Individual studies undertaken off-campus. Students submit petition to sponsoring agency.

LALS 199 - Tutorial (5)

Supervised directed reading; weekly or biweekly meetings with instructor. Final paper or examination required. Students submit petition to sponsoring agency.

LALS 199F - Tutorial (2)

Supervised research and writing of an expanded paper, completed in conjunction with requisite writing for an upper-division course taken for credit in the major. Students submit petition to sponsoring agency.

Graduate**LALS 200 - Bridging Latin American and Latina/o Studies (5)**

Provides historical and analytical foundations for the inter/transdisciplinary and transnational project of bridging the fields of Latin American and Latino studies (area and ethnic studies). Explores social, cultural, economic, and political changes connecting Latin America and U.S. Latina/o communities. Traces the intellectual genealogy of these efforts and how they contribute to each other. Introduces students to LALS' four substantive themes: (1) Transnationalisms, Migrations, and Displacement; (2) Intersectionality, Identities, and Inequalities; (3) Collective Action, Social Movements, and Social Change; and (4) Culture, Power, and Knowledge. Core requirement for students pursuing the Designated Emphasis in Latin American and Latino studies.

Prerequisite: Enrollment is restricted to graduate students.

LALS 200A - Power and Society (5)

Assesses key concepts organized around questions of power in contemporary Latina/o and Latin American interdisciplinary intellectual thought in the social sciences. Emphasis is on understanding power in relation to transnationalism and the department's substantive themes.

Prerequisite: Enrollment is restricted to graduate students.

LALS 200B - Cultures and Subjectivities in the Américas (5)

Introduces theoretical frameworks that explore the relationships between culture, power, and subjectivities. Emphasizes developing interdisciplinary, interpretive, and analytic skills and engages foundational critical approaches including queer theory, border theory, subaltern studies, intersectionality, feminisms, and critical race theory. (Formerly Theories of Culture in the Americas.)

Prerequisite: Enrollment is restricted to graduate students.

LALS 201 - Research in Practice (5)

Problematizes the construction of research approaches in the interdisciplinary field of Latin American and Latino studies, and showcases particular approaches in the social sciences and humanities so students may engage in innovative, transnational research. (Formerly Research in Praxis: Epistemology, Ontology, and Ethics.)

Prerequisite: Enrollment is restricted to graduate students.

LALS 202 - Latin/o American Spaces and Modernity (5)

Students engage and discuss texts that examine the relationship between space, narratives, and ideas of the modern nation, along with critical studies that highlight the social effects of imaginaries and representations.

Prerequisite: Enrollment is restricted to graduate students.

LALS 203 - Latin American Social Movements (5)

Grounds students in the social science literature on Latin American social movements, integrating anthropological, sociological, and political science approaches to the field.

Prerequisite: Enrollment is restricted to graduate students.

LALS 204 - Migration, Borders, and Borderlands (5)

Explores concepts and approaches related to migration; the multiple types of borders that migrants transcend--geopolitical, social, cultural, or interpersonal; and borderland formations constructed in relation to bodies in motion.

Prerequisite: Enrollment is restricted to graduate students.

LALS 205 - Comparison as Method (5)

Brings together comparative studies of physical and social mobility with a focus on race, migration, and citizenship. Both an articulation and study of comparison, course is organized around three components: comparative borders; comparative migration; and comparative ethnic studies. The questions animating it include: What happens when different histories, places, and peoples are compared? How and why do scholars in the humanities and humanistic social sciences compare? What are the strengths and challenges of a comparative approach? (Formerly offered as Comparative Mobilities.)

Prerequisite: Enrollment is restricted to graduate students.

LALS 206 - Queer Cuba (5)

Seminar that engages social, political, and cultural histories of homosexuality in Cuba, focusing on LGBT ostracism and activism after 1959, with particular attention to the social and economic impact of the developments of the USSR on Cuba's LGBT population.

Prerequisite: Enrollment is restricted to graduate students.

LALS 207 - Youth Cultures, Global Capitalism, and Social Change (5)

Introduces intellectual histories of youth studies scholarship in the context of Latin American and Latino studies; explores young people's lived experiences of racialized capitalism and globalization; and addresses various forms of youth resistance and the relationship between youth cultures, politics, and social change.

Prerequisite: Enrollment is restricted to graduate students.

LALS 208 - Politics of Childhood and Youth (5)

Explores how narratives about children, teens, youth, and students are imbued with political significance, and the ways

young people are actively engaged in political practices. Considers how representations and lived experiences of youth can serve to reproduce and/or challenge inequalities.

Prerequisite: Enrollment is restricted to graduate students.

LALS 210 - Latina Feminisms: Theory and Practice (5)

Through an interdisciplinary approach, explores Latina feminist social theory and scholarly practice—especially in representation and interpretation of Latina experiences. Examining key texts at different historical junctures, charts how Latinas of varied ethnic, class, sexual, or racialized social locations have constructed oppositional and/or relational theories and alternative epistemologies or political scholarly interventions and, in the process, have problematized borders, identities, cultural expressions, and coalitions.

Prerequisite: Enrollment is restricted to graduate students.

LALS 211 - Paradigms of Race/Color, Sexuality, and Culture in Latin America (5)

Explores foundational texts by Latin American intellectuals that have served to construct and sustain continental, regional, national, and transnational cartographies of identities and the search for *lo americano*. Examines race/color, sexuality, and culture by tracing their narrative and conceptual (trans)formations in the region and its diaspora. Most texts are read in the original language of publication.

Prerequisite: Enrollment is restricted to graduate students.

LALS 212 - Latina/o Ethnographic Practice (5)

Explores the social construction of Latino cultures in their varied regional, national-ethnic, and gendered contexts. Examines how culture, as a dynamic process constructed with a historical context of hierarchical relations of group power, is interrelated to the structural subordination of Latinos. Focuses on how power relations create a context for the creation of specific Latino cultural expressions and processes.

Prerequisite: Enrollment is restricted to graduate students.

LALS 215 - Latina Cultural Studies: Culture, Power, and Coloniality (5)

Examines the theories and practices informing the field of Latina cultural studies in the Americas. For students pursuing the Designated Emphasis in Latin American and Latino studies and students with interest in theories of coloniality of power, decolonialism, intercultural and transnational feminist methodologies.

Prerequisite: Enrollment is restricted to graduate students.

LALS 220 - Transnational Civil Society: Limits and Possibilities (5)

Analyzes social, civic, and political actors that come together across borders to constitute transnational civil society, drawing from political sociology, political economy, comparative politics, and anthropology to address collective identity formation, collective action, institutional impacts, and political cultures.

Prerequisite: Enrollment is restricted to graduate students.

LALS 225 - Race in the Americas (5)

Considers historical moments in the development of race in the Americas to understand how race is given meaning and actualized through practices, beliefs, and behaviors. Interrogates theories and racial dynamics in the 19th through 21st centuries to reveal interconnections with constructions of gender and nation.

Prerequisite: Enrollment is restricted to graduate students.

LALS 235 - Sexuality and Migration (5)

Approaches the nexus of sexuality and migration to examine contemporary theories of citizenship, security, violence, and power. Drawing on case studies that center experiences at, around, and across diverse borders throughout the Americas, the course takes an intersectional approach to understand: how migration is embedded in sexual identities and practices; and how sexuality, alongside race, class, and gender, influence who migrates and under what circumstances. Examining how researchers have approached sensitive questions of sexuality, students emerge better prepared to develop future research in the broader thematic fields of transnationalism, migration, and displacement.

Prerequisite: Enrollment is restricted to graduate students.

LALS 240 - Culture and Politics of Human Rights (5)

Examines cultural, philosophical, and political foundations for human rights and provides students with critical grounding in the major theoretical debates over conceptualizations of human rights in the Americas. Addresses the role of feminist activism and jurisprudence in the expansion of human rights since the Universal Declaration of Human Rights. Addresses challenges of accommodating gender rights, collective rights, and social and economic rights within international human rights framework.

Prerequisite: Enrollment is restricted to graduate students.

LALS 242 - Globalization, Transnationalism, and Gender in the Americas (5)

Explores how globalization, transnationalism, and the social construction of gender are interrelated, contingent, and subject to human agency and resistance. Examines particular configurations of globalization, transnationalism, and gender through the Americas and their implications for race, space, work, social movements, migration, and construction of collective memory.

Prerequisite: Enrollment is restricted to graduate students.

LALS 244 - Digital Mapping and Human Geographies (5)

Explores the utility of geographical information systems (GIS) for social science research. This course has three components: critical discussions of spatial analysis in published research, training in GIS software, and the application of digital mapping to students' research projects.

Prerequisite: Enrollment is restricted to graduate students.

LALS 245 - Epistemologies of the South (5)

Examines efforts by intellectuals from the Global South, mainly Latin America, to cast off the political, cultural, and epistemological notions imposed by European colonialism and preserved today through the practices of Western/Eurocentric knowledge, to forge their own epistemologies of the South.

Prerequisite: Enrollment is restricted to graduate students.

LALS 258 - Critical Cultural Political Economy (5)

Explores how the divide between cultural studies and political economy can be resolved through a post-disciplinary approach which is attentive to how semiotic and material practices co-constitute contemporary capitalism and an ever-changing set of strategies attempting to manage its multiple contradictions.

Prerequisite: Enrollment is restricted to graduate students, or by permission of the instructor.

LALS 292 - LALS Graduate Colloquium (2)

Required for all LALS graduate students in residence, colloquium includes a mix of activities aimed at supporting the development of graduate students as teachers, researchers, and active participants in academic communities. Includes lectures by distinguished speakers, work-in-progress sessions for both faculty and graduate student research, pedagogical theory and practice seminars, and professional development workshops.

Prerequisite: Enrollment is restricted to graduate students.

LALS 297A - Independent Study (5)

Students submit a reading course proposal to a department faculty member who supervises independent study in the field. Faculty and student jointly agree upon reading list. Students expected to meet regularly with faculty to discuss readings. This independent study must focus on a subject not covered by current UCSC graduate curriculum. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

LALS 297B - Independent Study (10)

Students submit a reading course proposal to a department faculty member who supervises independent study in the field. Faculty and student jointly agree upon reading list. Students expected to meet regularly with faculty to discuss readings. This independent study must focus on a subject not covered by current UCSC graduate curriculum. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

LALS 297C - Independent Study (15)

Students submit a reading course proposal to a department faculty member who supervises independent study in the field. Faculty and student jointly agree upon reading list. Students expected to meet regularly with faculty to discuss readings. This independent study must focus on a subject not covered by current UCSC graduate curriculum. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

LALS 299A - Thesis Research (5)

Enrollment restricted to graduate students and permission of instructor. Students submit petition to sponsoring agency.

LALS 299B - Thesis Research (10)

Enrollment restricted to graduate students and permission of instructor. Students submit petition to sponsoring agency.

LALS 299C - Thesis Research (15)

Enrollment restricted to graduate students and permission of instructor. Students submit petition to sponsoring agency.

LATN - LATIN**Lower-Division****LATN 1 - Elementary Latin (5)**

Instruction in Latin grammar, using a modern Latin method, designed to prepare for the study of classical literature. The sequence begins in the fall quarter only.

LATN 2 - Elementary Latin (5)

Instruction in Latin grammar, using a modern Latin method, designed to prepare for the study of classical literature.

Prerequisite: Prerequisite(s): LATN 1.

LATN 99 - Tutorial (5)

Students submit petition to sponsoring agency.

LATN 99F - Tutorial (2)

Students submit petition to sponsoring agency.

LGST - LEGAL STUDIES**Lower-Division****LGST 10 - Introduction to Legal Process (5)**

Introduction to U.S. and comparative legal institutions and practices. Examines diverse areas of law from torts to civil rights to international human rights. Why is America portrayed as having an activist legal culture; why is law used to decide so many questions from presidential elections to auto accidents; can law resolve disputes that, historically, have led to war and violence; is the legal system fair and/or effective, and, if so, for whom and under what conditions?

Upper-Division**LGST 108 - Gender, Sexuality, and Law (5)**

Analysis of legal issues related to gender, sexuality, and sexual orientation. Introduction to the key areas of gender and sexuality regulated by law and critical analysis of how law and policy should and do treat these issues.

Prerequisite: Enrollment is restricted to sophomore, junior, and senior legal studies majors during first and second pass enrollment only.

LGST 109 - Legal Theory (5)

Offers systematic exploration of alternative conceptions of the nature of law, including positivism, natural law, formalism, realism, pragmatism, and theories of justice. Additional focus on the nature of law; relation of law and morality, rights and other legal concepts; and philosophical debates such as critical legal studies and critical race theory.

Prerequisite: Enrollment is restricted to legal studies majors during first and second pass enrollment only.

LGST 111B - Civil Liberties (5)

Explores the status of American civil liberties as provided by the Bill of Rights. Particular attention will be given to issues of concern relating to the aftermath of 9/11, including issues relating to detainees, freedom of information requests, wiretapping authority, watch lists, profiling, and creation of a domestic intelligence agency.

Prerequisite: Enrollment is restricted to legal studies and politics majors during first- and second-pass enrollment only.

LGST 111C - Issues in Constitutional Law (5)

Examines variety of topics in constitutional law that are not covered in LGST 111A and LGST 111B. Focuses primarily on Supreme Court decisions and common-law debates.

Prerequisite: Enrollment is restricted to legal studies majors during first and second pass enrollment.

LGST 113 - Gay Rights and the Law (5)

Examines relevant court cases as well as local, state, and federal laws that define boundaries for legal recognition of sexual orientation and personal sexuality. Explores legal assumptions behind current and historical cases defining personal sexuality and sexual orientation and considers the social and political impetus in each era that drove the courts and legislatures to make such decisions.

LGST 114 - Jews, Anti-Semitism, and the American Legal System (5)

Explores how Jews have influenced and been impacted by the American legal system. Students explore significant cases, debates, and trends in the law as it relates to Jewish identity, religious freedom, and conceptions of justice.

Prerequisite: Enrollment is restricted to legal studies and Jewish studies majors during first and second pass enrollment.

LGST 115 - Law and the Holocaust (5)

Examines the Nazi philosophy of law, and how it was used to pervert Germany's legal system in order to discriminate against, ostracize, dehumanize, and ultimately eliminate certain classes of human beings, and the role of international law in rectifying the damage. Enrollment restricted to legal studies majors during priority enrollment only.

Prerequisite: Enrollment is restricted to legal studies majors during first and second pass enrollment.

LGST 116 - Comparative Law (5)

Explores how countries organize their societies through legal rules. Particular attention is given to constitutional design, differences between common and civil law systems, changes brought about by the European Union, and the convergence of legal norms globally.

Prerequisite: Enrollment is restricted to legal studies and politics majors during first and second pass enrollment.

LGST 117 - Sports, Law, and Politics (5)

Investigates the relationship between sports, law, and politics, focusing on racism, colonialism, post-colonialism, and globalization.

Prerequisite: Enrollment is restricted to legal studies majors during first and second pass enrollment.

LGST 118 - Law and Literature (5)

Explores variety of texts including novels, short stories, and essays as a source for reflection about the nature of law and legal practice. Readings include such writers as Herman Melville, Harper Lee, Richard Wright, Arthur Miller, Nadine Gordimer, and James Alan McPherson, among others.

Prerequisite: Enrollment is restricted to legal studies majors during first and second pass enrollment.

LGST 125 - History of the U.S. Penal Culture (5)

Explores the history and theory of U.S. state punishment from its 17th-century beginnings to the present and notes evolving models of criminal deviance, focusing on how punishment systems legitimate particular models of criminal deviance, crime, and its correction.

Prerequisite: Enrollment is restricted to legal studies majors during first and second pass enrollment.

LGST 130 - Inequality and Law (5)

Explores the complex relationship between race and the law in American society. Included subjects are critical race theory, civil rights and voting rights law, issues of the criminal justice system, intersections with issues of class and gender, and the social construction of race through law and legal decisions. (Formerly Race and the Law.)

Prerequisite: Enrollment is restricted to legal studies majors during first and second pass enrollment.

LGST 131 - Wildlife, Wilderness, and the Law (5)

Introduction to wildlife, wilderness, and natural resources law, policy, and management. Examines rules governing resource allocation and use including discussion of fundamental legal concepts. Explores laws and management policies affecting wildlife and wilderness, including their origins and impacts. Examines how conflicts over natural resources are being negotiated today.

Prerequisite: Enrollment is restricted to sophomore, junior, and senior legal studies majors during first and second pass enrollment.

LGST 133 - Law of Democracy (5)

Explores the role of law in both enabling and constraining the actions of elected politicians in the U.S. Among issues examined are voting rights, redistricting, and campaign finance. Course asks how the law shapes and limits our ability to choose our elected leaders, and in turn, how the law is shaped by political forces.

Prerequisite: Enrollment is restricted to legal studies majors during first and second pass enrollment.

LGST 135 - Native Peoples Law (5)

Explores the legal relationship between native peoples and the state. Examines the development of that relationship and several of the key legal issues currently confronting native peoples as they attempt to redress the injustices of the past.

Prerequisite: Enrollment is restricted to legal studies majors during first and second pass enrollment.

LGST 136 - Federal Indian Law and International Comparative Indigenous Peoples' Law (5)

Indian law refers to the body of law dealing with the status of Indian tribes, their inherent powers of self-government, their special relationship to the federal government, and the actual or potential conflicts of governmental power. Primary objective will be to address tribal reassertion of aboriginal sovereignty over culture and land in the context of increasing world recognition of indigenous rights.

Prerequisite: Enrollment is restricted to legal studies majors during first and second pass enrollment.

LGST 137 - International Environmental Law and Policy (5)

International environmental law (IEL) endeavors to control pollution and depletion of natural resources within a framework of sustainable development and is formally a branch of public international law—a body of law created by nation states for nation states, to govern problems between nation states. Examines landmark developments of IEL since 1972 within a historical continuum to better understand their strengths and weaknesses.

Prerequisite: Enrollment is restricted to legal studies majors during first and second pass enrollment.

LGST 139 - War Crimes (5)

Explores complex international human rights/humanitarian law issues surrounding genocide and other mass violence, beginning with the Nuremberg trials following World War II up to recent atrocities in Rwanda, Bosnia, and elsewhere. Covers basic legal framework of human rights law, examines specific situations on a case by case basis, and discusses what options the international community, the nations themselves, and individuals have in the wake of such catastrophes.

Prerequisite: Enrollment is restricted to legal studies majors during first and second pass enrollment.

LGST 146 - Philosophy of Law (5)

Introduction to topics in the philosophy of law. Begins by discussing some famously difficult legal cases. These motivate students to consider more generally how to theorize about law and legality. Course ends by examining a handful of modern legal issues from a philosophical perspective. Course asks students to formulate and defend their positions on classic and contemporary legal debates and provides them tools from moral and legal philosophy with which to work.

Crosslisted as: Prerequisite(s): PHIL 9; one from PHIL 11 or PHIL 22 or PHIL 23 or PHIL 24 or PHIL 80E or 80G or PHIL 80M or PHIL 80S; and PHIL 100A or PHIL 100B or PHIL 100C.

LGST 150 - Children and the Law (5)

Explores the legal rights of children. Topics may include juvenile justice, gang offenses, free speech and Internet censorship, religious rights, child custody and support, adoption, foster care, abuse and sexual harassment, special needs, public benefits, and medical care.

Prerequisite: Enrollment is restricted to legal studies majors during first and second pass enrollment.

LGST 152 - Courts and Litigation (5)

A study of the role of courts in society and the uses of litigation to address and deflect social problems. Focus is on recent developments in American litigation, but comparative materials may be considered.

Prerequisite: Enrollment is restricted to legal studies majors during first and second pass enrollment.

LGST 153 - Immigration, Citizenship, and Law (5)

Explores U.S. laws and policies regarding immigration and citizenship from historical and contemporary perspectives. Includes studying landmark court cases, key statutes and regulations governing immigration and citizenship, and scholarly treatments in order to critically examine historical developments and contemporary debates.

Prerequisite: Enrollment is restricted to legal studies majors during first and second pass enrollment.

LGST 154 - The Legal Profession (5)

Lawyers stand between the legal system and those who are affected by it. Examines this relationship descriptively and normatively, and from the point of view of sociological theory. Concentrates on the U.S. profession, with some comparative material.

Prerequisite: Enrollment is restricted to legal studies majors during first and second pass enrollment.

LGST 155 - Topics in American Legal History: Making of

American Constitutionalism (5)

Explores some aspects of early American constitutional thought, particularly immediately preceding the American Revolution situating early colonial constitutional thought within some of the larger themes and controversies of the 17th-century English constitutionalism, then considering some aspects of American constitutional thought in the founding period against the background of the colonial experience. Prerequisite(s): permission of instructor: selection based on the ability to do very advanced work. Enrollment restricted to legal studies majors during first and second pass enrollment.

LGST 156 - Administrative Law and Challenges of Regulation (5)

The rise of the regulatory state brings with it a host of questions regarding the exercise of state power and separation of powers. Takes up some of these questions; in particular, questions about administrative agencies and their relationship to the judiciary, the legislature and private individuals and groups. (Formerly Administrative Jurisprudence.)

Prerequisite: Enrollment is restricted to legal studies majors during first and second pass enrollment.

LGST 157 - Political Jurisprudence (5)

Explores some themes in legal and political theory, especially on the relationship of theories of justice, law, and ethics.

Prerequisite: Enrollment is restricted to legal studies majors during first and second pass enrollment.

LGST 158 - Law and Politics of Memory (5)

Examines why we choose to memorialize some aspects of our history, but not others. What impact do those choices have on our contemporary politics and society? How may memorials help create a stronger democracy?

LGST 159 - Property and the Law (5)

Begins with an examination of the concept of property, then covers how different cultures characterize property and determine ownership and the laws and policies that define property in modern society. Topics include theories of property law, common property, property and natural resources, zoning, regulatory takings, and intellectual and cultural property

Prerequisite: Enrollment is restricted to legal studies majors during first and second pass enrollment.

LGST 161 - Intellectual Property (5)

Advanced study of the concepts, practices, and history of intellectual property. Typically, it is a study of how, when, and why you can own something like an idea, a story, a mathematical algorithm, a business process, or an arrangement of cells. Course is organized around different kinds of things one might own: artistic creation and representation (copyright), scientific discovery and invention (patents), and business processes and secrets (trademark and trade secrets). Studies different intellectual property regimes and the philosophical and moral issues underlying claims to intellectual property.

LGST 173 - Disability, Law, & Politics (5)

Introduction to how individuals, societies, and states answer fundamental questions about disability, including what is or is not a disability, what causes disability, and what the proper responses to the existence of disabilities are.

LGST 185 - Legal Studies Internship/Field Seminar: Experiences in Law, Policy, and Society (5)

A practicum seminar for students seeking field experience in law- and policy-making settings. Designed to be combined with an internship; provides structured class meetings and work, including weekly field notes and a final paper.

Prerequisite: Prerequisite(s): LGST 10. Enrollment is restricted to sophomores, juniors, and seniors.

LGST 188A - Introduction to the Legal Profession and Legal Aid Work (2)

Offers a basic introduction to key aspects of the Legal Profession, generally, as well as an introduction to the specific area of the profession known as Legal Aid -- the system and services through which under-served communities gain access to legal services. Course covers key elements of the legal profession and legal aid work, offering practical information and training on topics such as professional responsibility, ethics, confidentiality, interviewing skills, record keeping, communication, and working with diverse clients. It is particularly designed as a preparation or companion course for law-related internships and field student through courses such as OAKS 188B / LGST 188B (3 credits), OAKS 199, or LGST 185 Internship (5 credits). Enrollment by permission of the instructor.

LGST 193 - Field Study (5)

Field research performed off-campus, under the supervision of a member of the legal studies faculty.

LGST 194 - Group Tutorial (5)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Students submit petition to sponsoring agency.

LGST 195A - Senior Thesis (5)

Preparation of a senior thesis over one, two, or three quarters, beginning in any quarter. When taken as a multiple-term course extending over two or three quarters, the grade and evaluation submitted for the final quarter apply to each of the previous quarters. Students submit petition to sponsoring agency.

LGST 195B - Senior Thesis (5)

Preparation of a senior thesis over one, two, or three quarters, beginning in any quarter. When taken as a multiple-term course extending over two or three quarters, the grade and evaluation submitted for the final quarter apply to each of the previous quarters. Students submit petition to sponsoring agency.

LGST 195C - Senior Thesis (5)

Preparation of a senior thesis over one, two, or three quarters, beginning in any quarter. When taken as a multiple-term course extending over two or three quarters, the grade and evaluation submitted for the final quarter apply to each of the previous quarters. Students submit petition to sponsoring agency.

LGST 196 - Senior Capstone (5)

Examines related legal topics from an interdisciplinary perspective. Each focuses broadly on the relationship between law as a distinct system and law as an attempt to achieve justice, which requires that law remain open to claims of political morality generally. To what extent are legal norms internal to a separate system called law and to what extent are claims of political right in general relevant to question of what law is?

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior legal studies majors.

LGST 198 - Independent Field Study (5)

Individual studies undertaken off-campus for which faculty supervision is not in person, but by correspondence. Students submit petition to sponsoring agency.

LGST 198F - Independent Field Study (2)

Individual studies undertaken off-campus for which faculty supervision is not in person, but by correspondence. Students submit petition to sponsoring agency.

LGST 199 - Tutorial (5)

A student normally approaches a faculty member and proposes a LGST 199 course on a subject he or she has chosen. Students submit petition to sponsoring agency.

LGST 199F - Tutorial (2)

A student normally approaches a faculty member and proposes a LGST 199 course on a subject he or she has chosen. Students submit petition to sponsoring agency.

LING - LINGUISTICS**Lower-Division****LING 50 - Introduction to Linguistics (5)**

An introduction to the major areas, problems, and techniques of modern linguistics.

LING 53 - Semantics I (5)

Introduction to the logical foundations of natural language semantics. Logical and semantic relations, simple set theory, logical representations (propositional and predicate calculi, modal and tense logics) and their interpretations. A basic literacy course in the language of logical representation.

LING 80C - Language, Society, and Culture (5)

The study of language from a sociological perspective. Multilingualism, language change and variation, pidgins and creoles, the origin and diversification of dialects.

LING 80D - Language and Mind (5)

Examines how the properties of human languages can be used to understand how the mind works and to what extent language use and experience can affect how we think. Topics covered include: human language vs. other forms of animal communication, language deficits and impairments, how language experience shapes perception, the nature of language acquisition, and the extent to which cross-linguistic variation affects other kinds of cognition. The course also provides historical context of the development of modern language science, with a critical overview of Noam Chomsky's linguistics.

LING 80K - Invented Languages, from Elvish to Esperanto (5)

Considers invented languages, including Elvish and Klingon, as well as lesser-known ones that tackle ethical, social, or cognitive concerns. Students learn tools from contemporary linguistics to analyze language structures and understand how they relate to creator intentions.

LING 80M - Language and Indigeneity in Mesoamerica (5)

Explores indigenous experiences in Mesoamerica, focusing on the role of language in the formation of indigenous identities, both historically and in contemporary society. Also considers the linguistic correlates of inequalities experienced by indigenous communities since European contact. Students learn about some of the unique features of Mesoamerican indigenous languages, but no prior experience with linguistics is presumed.

LING 80S - The Science of Language: An Introduction to Linguistics for Non-Majors (5)

A general overview of the major areas, problems, and techniques of modern linguistics. This course is not suitable for majors in the Linguistics Department.

LING 80V - Structure of the English Vocabulary (5)

A systematic study of the elements of English words: besides the practical goal of vocabulary consolidation and expansion, explores the historical origin and development of word elements, as well as their sound, meaning, and function in the contemporary language.

LING 99 - Tutorial (5)

Students submit petition to sponsoring agency.

Upper-Division**LING 100 - Phonetics I (5)**

Provides a comprehensive introduction to the sounds of human language. Involves a detailed examination of the human vocal tract, the mechanics of phonetic transcription within the system of the International Phonetic Alphabet (IPA), and the essentials

of phonology, particularly how to do phonemic analysis of any language.

LING 101 - Phonology I (5)

Introduction to how sounds pattern in grammars-why they vary, how they combine, etc. Emphasis is on developing theories to explain the patterns. Topics include distinctive feature theory, phonemic analysis, autosegmental phonology, and principles of syllabification and stress.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and GE Composition requirements and LING 100.

LING 102 - Phonology II (5)

Advanced phonological theory. Topics include markedness; underspecification theories; advanced topics in feature geometry, syllable theory, and stress theory; and optimality theory. Readings include published articles. Emphasis on theory construction and argumentation based on data.

Prerequisite: Prerequisite(s): LING 101, and LING 111 or LING 112.

LING 103 - Phonology III (5)

Advanced topics in phonology, with an emphasis on reading both classic and contemporary research articles and book chapters. Prerequisite(s): LING 102 and enrollment by interview.

LING 105 - Morphology (5)

Study of the principles of word formation: derivation, inflection, and compounding; cross-linguistic study of morphological processes, morphological investigation and analysis.

Prerequisite: Prerequisite(s): LING 101, and LING 111 or LING 112.

LING 108 - Poetry and Language (5)

An introduction to the linguistic aspects of poetry, e.g., rhyme, meter, and larger-scale organization of poetic form. The emphasis is on English poetry, complemented by brief sketches of other poetic traditions.

Prerequisite: Prerequisite(s): LING 101, and LING 111 or LING 112.

LING 111 - Syntactic Structures (5)

Provides a basic introduction to the methods and results of generative grammar. It simultaneously provides an overview of the major syntactic constructions of English.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

LING 112 - Syntax I (5)

An introduction to syntactic investigation, developed through the study of central aspects of English syntax. A major purpose is to introduce students to the study of language as an empirical science.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

LING 113 - Syntax II (5)

Further aspects of English syntax; universal and language-particular constraints on syntactic structures and rules. Further developments and extensions of generative theory.

Prerequisite: Prerequisite(s): LING 53, and LING 111 or LING 112.

LING 114A - Syntax III (5)

Advanced topics in syntax. Prerequisite(s): LING 113, satisfaction of the Entry Level Writing and Composition requirements and permission of instructor.

LING 114B - Readings in Linguistics (5)

Introduces reading the primary literature in a sub-discipline of linguistics. Topics vary by instructor interest and readings will vary as a result. Emphasis is on how to read technically difficult works, evaluate arguments, and appreciate competing views. Coursework includes readings, presentations, and short response papers. Enrollment is by permission of the instructor. Students should have completed appropriate upper-division courses in the relevant sub-disciplines; see instructor for recommendations. (Formerly offered as Readings in Syntax.)

LING 114C - Topics in Linguistics (5)

Advanced undergraduate course devoted to a topic in linguistics. Topics and linguistics sub-disciplines covered vary with instructor interest. Coursework includes problem sets, readings, presentations, and a term paper. Enrollment by permission of instructor. Students should have completed appropriate upper-division courses in the relevant sub-disciplines; see instructor for recommendations. (Formerly offered as Topics in Syntax.)

LING 116 - Semantics II (5)

Major issues in natural language semantics: nature of lexical entries, thematic relations, propositional representation or logical form; relation between semantic interpretation and syntactic representations, quantification and scope relations, reference and presupposition, coreference and anaphoric relations.

Prerequisite: Prerequisite(s): LING 53, and LING 111 or LING 112.

LING 117 - Pragmatics (5)

Covers topics central in the study of pragmatics, the interpretation of language use. Topics include conversational implicature, speech acts and discourse understanding, and social deixis.

Prerequisite: Prerequisite(s): LING 53 and LING 101; and LING 111 or LING 112.

LING 118 - Semantics III (5)

Uses the tools learned in LING 53 and LING 116 (Semantics I and Semantics II), giving students the opportunity to explore important topics with heavy emphasis placed on reading primary-source literature. Readings form the basis for weekly lectures and the discussion section. Prerequisite(s): LING 116. Enrollment is by permission of instructor.

LING 120 - Structure of English (5)

Survey of grammatical structure of English and terminology of grammatical description. Covers phonological, morphological, and syntactic structure of English and contrasts it with other languages.

Prerequisite: Prerequisite(s): LING 101, and LING 111 or LING 112.

LING 124 - Language Typology (5)

Introduces the branch of linguistics whose goal is to describe and explain the structural diversity of the world's languages. Focuses on what is known about variation in particular domains (e.g., syllable structure, word order, evidentiality), and how it might be explained.

Prerequisite: Prerequisite(s): LING 111 or LING 112, and LING 101.

LING 125 - Foundations of Linguistic Theory (5)

Survey of some of the history and foundational assumptions of generative grammar; also looks at some of the influence of generative linguistic theorizing on disciplines outside linguistics, notably psychology and philosophy.

Prerequisite: Prerequisite(s): LING 113 or LING 116.

LING 127 - History of Linguistics (5)

Topics in the history of linguistics, with a special focus on the 20th century.

Prerequisite: Prerequisite(s): LING 101, and LING 111 or LING 112.

LING 131 - Spanglish: Language and Identities through Contact (5)

In this synchronous online class, students investigate Spanglish as a linguistic and cultural phenomenon. Students learn linguistic tools to describe, analyze, and destigmatize Spanglish, and explore the ways that it is used to establish identity. Additionally, students compare Spanglish to ways of communicating in other bilingual contexts.

LING 132 - California Englishes (5)

Examines varieties of California Englishes and the features that compose these varieties. Through this examination, course also tries to better understand how social categories such as race, gender, sexuality, age, and class relate to the linguistic variation found in California English varieties. Course also seeks to explain how linguistic features acquire social meaning, and how these features are adopted in the construction of identity.

Prerequisite: Prerequisite(s): LING 50.

LING 133 - Language OnLine (LOL): Communication in the Digital Era (5)

In the age of social media, much of communication happens online. Despite claims to the contrary, the internet has not destroyed language; rather, language is thriving in new and vibrant ways online. This course uses the tools of linguistics to explore how the internet (with acronyms, emojis, and memes) has affected language use and how properties of language continue to shape online communication technologies. Topics covered include: whether emojis are language, what makes a spicy meme, how communities form online, and how online linguistic behaviors aid in the spread of misinformation.

LING 140 - Language Change (5)

Methods and problems in the study of change in linguistic systems. Reconstruction of proto-languages; the comparative method. Theories of change and implications for the theory of grammar.

Prerequisite: Prerequisite(s): LING 101, and LING 111 or LING 112.

LING 141 - Ellipsis (5)

Introduction to and survey of the ellipsis in natural language, including the typology of ellipsis processes, cross-linguistic uniformity and variation in ellipsis, and theoretical approaches and issues.

Prerequisite: Prerequisite(s): LING 53 and LING 101; and LING 111 or LING 112.

LING 144 - Computational Methods for Linguists (5)

Introduction to computational methods for linguists with little background in computer programming. Possible topics include: regular expressions, annotation, databases, and search. Students learn contemporary techniques in team-based programming and annotation.

Prerequisite: Prerequisite(s): LING 50, LING 53, and either LING 111 or LING 112. Enrollment is restricted to linguistics and language studies majors.

LING 145 - Native Languages of North America (5)

Selective survey of the indigenous languages of North America, including a formal/structural component and an historical/social component. Topics include typological properties of these languages, current status, and revitalization efforts.

Prerequisite: Prerequisite(s): LING 101, and either LING 111 or LING 112.

LING 147 - Quantitative Methods in Linguistics (5)

Introduces quantitative methods for linguistics. Focuses on categorical data and continuous data, and using R. Students learn the basics of probability, statistics, and experimental design, and use R to apply them to linguistic data sets.

Prerequisite: Prerequisite(s): LING 53 and LING 101, and either LING 111 or LING 112.

LING 151 - Phonetics II (5)

Hands-on introduction to instrumental phonetic analysis, phonetic analysis using experimental methods. Emphasis is on the acoustics and perception of speech. (Formerly Phonetic Analysis.)

Prerequisite: Prerequisite(s): LING 100.

LING 152 - Applied Phonetics (5)

Examines areas in which phonetic analysis and experimentation are used in practice. Emphasizes problem-solving, experiments, and analytical tasks.

Prerequisite: Prerequisite(s): LING 151.

LING 154 - Language and Social Identity (5)

Introduction to sociolinguistics exploring the relationship between language and such social parameters as social status, ethnicity, race, gender, etc., including the role of language differences in the creation of social stereotypes. Emphasis on gathering, examining, and reporting data.

Prerequisite: Prerequisite(s): LING 101, and either LING 111 or LING 112.

LING 155 - Language and Cognition (5)

Introduces and examines some of the foundational assumptions, practices, and methods of generative grammar in comparison to those of other areas of cognitive science, notably psychology and philosophy.

Prerequisite: Prerequisite(s): LING 111 or LING 112; and LING 53 and LING 101.

LING 160 - Language Engineering (5)

Addresses a particular problem in language engineering, chosen for its practical and theoretical interest and its tractability. The entire course focuses on a team project to design a solution to the problem. Permission of instructor required.

LING 164 - Linguistics for Engineers (5)

Introduction to computational linguistics for engineers with a focus on providing background and skills in linguistics. Students are expected to already have programming skills and basic computer science. Knowledge of shell scripting or a scripting language suggested.

Prerequisite: Prerequisite(s): CSE 10 and CSE 14, or permission of instructor.

LING 171 - Psycholinguistics I (5)

Theory and methods in psycholinguistics, covering perception, production, and acquisition of language and linguistic structure. A hands-on, laboratory-style introduction to the topic, focusing on the relation between experimental findings and linguistic theory. Students cannot receive credit for this course and LING

257. (Formerly LING 157, Psycholinguistics and Linguistic Theory.)

Prerequisite: Prerequisite(s): LING 50.

LING 172 - Psycholinguistics II (5)

Advanced topics in psycholinguistics and experimental linguistics, contemporary memory models, computational models of comprehension and production, and neurolinguistic findings and methodologies. Student work revolves around an extended research project in which students learn to apply advanced analytical techniques. (Formerly LING 158, Advanced Psycholinguistics.)

Prerequisite: Prerequisite(s): LING 171.

LING 180 - Structure of a Particular Language (5)

Topics in the phonology, morphology, syntax, or semantics of a language that is the research interest of the instructor. The language investigated changes with each offering of the course.

Prerequisite: Prerequisite(s): LING 101; and LING 111 or LING 112.

LING 181 - Structure of Romance Languages (5)

Discusses topics in the phonology, syntax, and semantics of Romance languages, with emphasis left to the discretion of the instructor. Students read original research articles and pursue empirical investigation of Romance languages by collecting data from scholarly publications, fieldwork, and/or corpus analysis. Some knowledge of Italian, French, or Spanish is required.

Prerequisite: Prerequisite(s): LING 101, and LING 111 or LING 112.

LING 182 - Structure of Spanish (5)

The phonology and syntax of Spanish, studied from a modern linguistic perspective. Some knowledge of Spanish is required.

Prerequisite: Prerequisite(s): LING 101, and LING 111 or LING 112.

LING 183 - Structure of French (5)

The phonology, morphology, and syntax aspects of French. Some knowledge of French is helpful.

Prerequisite: Prerequisite(s): LING 101, and LING 111 or LING 112.

LING 185 - Structure of Russian (5)

The phonology, morphology, and syntax of Russian. Some knowledge of Russian is helpful.

Prerequisite: Prerequisite(s): LING 101, and LING 111 or LING 112.

LING 186 - Structure of German (5)

Phonological, morphological, and syntactic aspects of the structure of the German language. Some knowledge of German is required.

Prerequisite: Prerequisite(s): LING 101, and LING 111 or LING 112.

LING 187 - Structure of Japanese (5)

The phonology, morphology, and syntax of Japanese.

Prerequisite: Prerequisite(s): LING 101, and LING 111 or LING 112.

LING 188 - Structure of Chinese Languages (5)

Introduces the syntax and semantics of Chinese Languages (particularly Cantonese and Mandarin), especially those aspects that are typologically different from Indo-European languages like English. Students learn to appreciate typological differences in natural languages and develop skills to analyze them. Course involves a global classroom component: throughout the quarter students meet and work with students from another institute in an international location to explore language differences.

Prerequisite: Prerequisite(s): LING 101; and LING 111 or LING 112.

LING 189 - Structure of Arabic (5)

The phonology, morphology, and syntax of Arabic. (Mainly modern standard, but also some regional dialects.) No knowledge of Arabic is required.

Prerequisite: Prerequisite(s): LING 101, and LING 111 or LING 112.

LING 190 - Senior Research (2)

Students produce a research paper or other significant project to satisfy the capstone requirement. Prerequisite(s): LING 101, and either LING 111 or LING 112. Concurrent enrollment in a specified upper-division course is required. Enrollment is by permission of the instructor and is restricted to senior linguistics and language studies majors.

LING 193 - Field Study (5)

Students submit petition to sponsoring agency.

LING 195 - Senior Thesis (5)

Deadline for submission of thesis proposal is one year in advance of proposed completion. Students submit petition to sponsoring agency.

LING 198 - Independent Field Study (5)

Provides for department-sponsored individual study programs off campus for which faculty supervision is not in person (e.g., supervision by correspondence). Preparation and approval must be completed by the fifth day of instruction of any given quarter. Students submit petition to sponsoring agency.

LING 199 - Tutorial (5)

Students submit petition to sponsoring agency.

LING 199F - Tutorial (2)

Students submit petition to sponsoring agency.

Graduate

LING 211 - Phonology A (5)

First part of a three quarter introduction to phonology. Topics of the sequence include fundamentals of acoustic phonetics; introduction to optimality theory; theories of syllabification, stress, and prosodic organization; prosodic morphology; advanced issues in faithfulness and correspondence; segmental and suprasegmental processes.

Prerequisite: Enrollment is restricted to graduate students or by permission of instructor.

LING 212 - Phonology B (5)

Second part of a three quarter introduction to phonology. Topics of the sequence include fundamentals of acoustic phonetics; introduction to optimality theory; theories of syllabification, stress, and prosodic organization; prosodic morphology; advanced issues in faithfulness and correspondence; segmental and suprasegmental processes.

Prerequisite: Prerequisite(s): LING 211. Enrollment is restricted to graduate students or by permission of instructor.

LING 214 - Phonetics (5)

Introduction to phonetic theory concentrating on acoustic phonetics and speech perception along with common experimental methods, the role of phonetic principles in explaining phonological patterns and markedness.

Prerequisite: Enrollment is restricted to graduate students or by permission of instructor.

LING 216 - Phonology Proseminar (5)

One or more topics in phonological theory. Topics vary from year to year, covering literature and current research in phonology.

Prerequisite: Prerequisite(s): LING 212. Enrollment is restricted to graduate students or by permission of instructor.

LING 219 - Phonology Seminar (5)

Advanced topics in phonology drawn from the current research interests of the instructor.

Prerequisite: Prerequisite(s): LING 212. Enrollment is restricted to graduate students or by permission of instructor.

LING 219G - Phonology Seminar (3)

Advanced topics in phonology drawn from the current research interests of the instructor. Three-credit version of LING 219. Does not require a final paper.

Prerequisite: Prerequisite(s): LING 212. Enrollment is restricted to graduate students.

LING 221 - Syntax A (5)

Introduction to syntactic theory. Phrase structure; subcategorization; lexical entries; passive; infinitival constructions.

Prerequisite: Enrollment is restricted to graduate students or by permission of instructor.

LING 222 - Syntax B (5)

Continuation of Syntax A. The syntax of unbounded dependencies, including constituent questions, relative clauses, clefts, topicalization. Constraints on extraction; unbounded versus successive cyclic movement; the licensing of gaps.

Prerequisite: Prerequisite(s): LING 221. Enrollment is restricted to graduate students or by permission of instructor.

LING 226 - Proseminar in Syntax (5)

In-depth investigation of some topic in syntactic theory. Topics vary from year to year, covering literature and current research in grammatical structure from varying theoretical perspectives.

Prerequisite: Prerequisite(s): LING 222. Enrollment is restricted to graduate students.

LING 226G - Proseminar in Syntax (3)

In-depth investigation of some topic in syntactic theory. Topics vary from year to year, covering literature and current research in grammatical structure from varying theoretical perspectives. Three-credit version of LING 226. Does not require a final paper.

Prerequisite: Prerequisite(s): LING 222. Enrollment is restricted to graduate students.

LING 229 - Syntax Seminar (5)

Advanced topics in syntax drawn from the current research interests of the instructor.

Prerequisite: Prerequisite(s): LING 222. Enrollment is restricted to graduate students or by permission of instructor.

LING 229G - Syntax Seminar (3)

Advanced topics in syntax drawn from the current research interests of the instructor. Three-credit version of LING 229. Does not require a final paper.

Prerequisite: Prerequisite(s): LING 222. Enrollment is restricted to graduate students.

LING 231 - Semantics A (5)

Introduction to linguistic semantics: nature of lexical entries, thematic relations, representation of logical form; relation between semantic interpretation and syntactic representation, quantification and scope relations, reference and presupposition.

Prerequisite: Enrollment is restricted to graduate students or by permission of instructor.

LING 232 - Semantics B (5)

Model-theoretic semantics for natural language. Truth-conditional, compositional semantics. Various logical ontologies and their application to natural language categories.

Dynamic interpretation of discourse and anaphoric relations. Treatment of illocutionary force.

Prerequisite: Prerequisite(s): LING 231. Enrollment is restricted to graduate students or by permission of instructor.

LING 236 - Proseminar in Semantics (5)

In-depth investigation of some topic in semantics and pragmatics. Topics vary from year to year, covering literature and current research in linguistic semantics and pragmatics.

Prerequisite: Prerequisite(s): LING 231. Enrollment is restricted to graduate students or by permission of instructor.

LING 236G - Semantics Proseminar (3)

In-depth investigation of some topic in semantics and pragmatics. Topics vary from year to year, covering literature and current research in linguistic semantics and pragmatics. Three-credit version of LING 236. Does not require a final paper.

Prerequisite: Prerequisite(s): LING 231. Enrollment is restricted to graduate students, or by consent of instructor.

LING 239 - Semantics Seminar (5)

Advanced topics in semantics drawn from the current research interests of the instructor.

Prerequisite: Prerequisite(s): LING 232. Enrollment is restricted to graduate students or by permission of instructor.

LING 239G - Semantics Seminar (3)

Advanced topics in semantics drawn from the current research interests of the instructor. Three-credit version of LING 239. Does not require a final paper.

Prerequisite: Prerequisite(s): LING 232. Enrollment is restricted to graduate students.

LING 240 - The Pedagogy of Linguistics (1)

Provides training for graduate students in university-level pedagogy in general and in the pedagogy of linguistics specifically. Under the supervision of a faculty member, coordinated by a graduate student with substantial experience as a teaching assistant.

Prerequisite: Enrollment is restricted to graduate students.

LING 244 - Computational Methods for Linguists (5)

Practical introduction to computational methods for linguists. Topics covered: database development; indexation and search; morphological and syntactic parsing; and modern annotation methodologies. Students concurrently learn Python and JavaScript. No background in programming is required.

Prerequisite: Enrollment is restricted to graduate students, or by consent of the instructor.

LING 248 - Topics in Computational Methods and Models (5)

Seminar in computational approaches in linguistics and the language sciences with topics drawn from the current interests of the instructor.

Prerequisite: Prerequisite(s): LING 221 and LING 231. Enrollment is restricted to linguistics graduate students.

LING 249 - Morphology Seminar (5)

Presents theoretical and descriptive issues, particularly those raised by the framework of distributed morphology and its current competitors. Course work consists of readings, squibs, and a term paper.

Prerequisite: Enrollment is restricted to graduate students.

LING 249G - Morphology Seminar (3)

Presents theoretical and descriptive issues, particularly those raised by the framework of distributed morphology and its current competitors. Coursework consists of readings and squibs. Three-credit version of LING 249. Does not require a final paper.

Prerequisite: Enrollment is restricted to graduate students.

LING 257 - Psycholinguistics and Linguistic Theory (5)

Theory and methods in psycholinguistics, covering perception, production, and acquisition of language and linguistic structure. A hands-on, laboratory-style introduction to the topic, focusing on the relation between experimental findings and linguistic theory. Students cannot receive credit for this course and LING 157 or LING 257G

Prerequisite: Enrollment is restricted to graduate students.

LING 258 - Advanced Psycholinguistics (5)

Advanced topics in psycholinguistics and experimental linguistics. Contemporary memory models. Computational models of comprehension and production. Neurolinguistic findings and methodologies. Student work revolves around an extended research project in which students learn to apply advanced analytical techniques. Graduate students have separate evaluation criteria. Students cannot receive credit for this course and LING 258G.

Prerequisite: Prerequisite(s): LING 257. Enrollment is restricted to graduate students.

LING 258G - Advanced Psycholinguistics (3)

Advanced topics in psycholinguistics and experimental linguistics. Contemporary memory models. Computational models of comprehension and production. Neurolinguistic findings and methodologies. Student work revolves around an extended research project in which students apply advanced analytical techniques. Graduate students have separate evaluation criteria. Three-credit version of LING 258. Does not require a final paper. Students cannot receive credit for this course and LING 258.

Prerequisite: Prerequisite(s): LING 257. Enrollment is restricted to graduate students.

LING 259 - Phonetics Seminar (5)

Advanced topics in acoustic and articulatory phonetics.

Prerequisite: Prerequisite(s): LING 214. Enrollment is restricted to graduate students.

LING 259G - Phonetics Seminar (3)

Advanced topics in acoustic and articulatory phonetics. Three-credit version of LING 259. Does not require a final paper.

Prerequisite: Prerequisite(s): LING 214. Enrollment is restricted to graduate students.

LING 279 - Research Seminar in Psycholinguistics (5)

Contemporary research in psycholinguistic theory models, and methods. Topics vary with research interests of faculty and graduate students.

Prerequisite: Enrollment is restricted to graduate students or by permission of instructor.

LING 280 - Proseminar in Experimental Linguistics (5)

Examines experimental design and analysis for gathering linguistic data; the advantages and disadvantages of major response measures, including reaction times; interaction with extra-grammatical factors; and statistics on categorical and continuous measures. Students present results in research papers. Students cannot receive credit for this course and course 280G.

Prerequisite: Enrollment is restricted to graduate students.

LING 280A - Linguistic Investigation (5)

Methods of primary linguistic investigation. Close study of one language typologically different from English. Data analysis and elicitation techniques.

Prerequisite: Enrollment is restricted to graduate students.

LING 280B - Linguistic Investigation (5)

Linguistic Investigation

Prerequisite: Enrollment is restricted to graduate students.

LING 280G - Proseminar in Experimental Linguistics (3)

Examines experimental design and analysis for gathering linguistic data: the advantages and disadvantages of major response measures, including reaction times; interaction with extra-grammatical factors; and statistics on categorical and continuous measures. Three-credit version of LING 280. Does not require a final paper.

Prerequisite: Enrollment is restricted to graduate students.

LING 282 - Field Methods (5)

Exploration of a language previously unfamiliar to students through elicitation from a native speaker. Discussion of

elicitation techniques. Students investigate selected aspects of the language in depth. Enrollment is restricted to graduate students; enrollment is by instructor permission only.

LING 290 - Research Seminar (5)

A research seminar for undergraduate and graduate students to develop the skills of the profession. Critical reading, reviewing, teaching, presentation, and writing. Students submit petition to sponsoring agency. Enrollment is restricted to graduate students or by permission of instructor.

LING 295 - Directed Reading (5)

Directed reading which does not involve a term paper. Enrollment is restricted to graduate students or by permission of instructor.

LING 296 - Linguistics Colloquium (2)

Independent graduate-level activities and assignments relating to professionalism; organizing and attending colloquium and conferences; participation in discussion at such events; and preparation of commentaries on academic papers. Students submit petition to sponsoring agency. Enrollment is restricted to linguistics graduate students.

LING 297A - Independent Study (5)

Enrollment restricted to graduate standing or consent of instructor.

LING 297B - Independent Study (10)

Enrollment restricted to graduate standing or consent of instructor.

LING 297C - Independent Study (15)

Enrollment restricted to graduate standing or consent of instructor.

LING 297F - Independent Study (2)

Two-credit independent study. Enrollment restricted to graduate students, or by consent of instructor.

LING 299A - Thesis Research (5)

LING 299B - Thesis Research (10)

LING 299C - Thesis Research (15)

LIT - LITERATURE

Lower-Division

LIT 1 - Literary Interpretation (5)

Close reading and analysis of literary texts, including representative examples of several different genres and periods. An introduction to practical criticism required of all literature majors; should be completed prior to upper-division work in literature.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted

to first-year students and sophomores, or literature and proposed literature majors and literature minors.

LIT 61C - Devils, Dervishes, and Bawdy Tales from Baghdad to Canterbury: The Story within the Story (5)

A story within a story, the frame tale is a playful and enduring literary genre. Focuses on frame tales of the global middle ages, tracing their movement from the Indian subcontinent to the British Isles. Readings include selections from Fables of Bidpai, The Arabian Nights, Libro de Buen Amor, and The Canterbury Tales. (Formerly The Frame Tale.)

LIT 61F - Introduction to Reading Fiction (5)

Close reading of short stories and some novels with the aim of developing critical methods for the analysis and interpretation of prose fiction. Topics include character, plot, narrative structure, and the poetics of prose. The course topic changes; please see the Class Search for the current topic.

LIT 61H - Reading the Movies (5)

Introduces techniques for the close reading of film (shot-by-shot analysis, etc.), with particular attention to what makes film different from other media. Films studied will cohere around a specific theme, geography, or genre, like film noir. (Formerly Introduction to Film Analysis.)

LIT 61J - Introduction to Jewish Literature and Culture (5)

Surveys 3,000 years of Jewish literature and culture. Themes include origins of the Jews in the ancient world; formation and persistence of the Jewish diaspora; coherence and diversity of Jewish experience; Jewish narrative and textual traditions; interaction between Jews and other cultures; tensions between tradition and modernity.

LIT 61K - Introduction to the Fairy Tale (5)

Introduces the fairy tale as a genre, including historical, cultural, and political contexts; relation to identity, performance, transnationalism; contemporary transformations of tales and their expression in other media (e.g., film, art, theater); and current scholarship.

LIT 61L - True Stories: Memoir (5)

Historical overview of the genre from Augustine to contemporary experiments in memoir. Student write weekly creative-critical responses and a final creative-critical paper.

LIT 61M - Approaches to Classical Myth (5)

Introduction to Greek myths, including selected ancient texts and visual artifacts, historical and cultural context of their creation and reception, modern theoretical approaches such as structuralism and psychoanalysis, and interpretations in various media.

LIT 61N - Introduction to Children's Literature (5)

Introduction to children's literature as a literary genre, including historical, cultural, and political considerations of the genre's relationship to gender, race, sexuality, nationalism, colonialism,

and popular culture through primary texts, secondary criticism, and other media (e.g., film, illustration, comics).

LIT 61P - Introduction to Reading Poetry (5)

An introduction to selected modes and forms of poetry with an emphasis on close textual analysis. Examples will be taken from different historical periods and poetic traditions. Course topic changes; please see the Class Search for the current topic.

LIT 61R - Race in Literature (5)

An investigation into the various uses and abuses of race in literature. Course topic changes; see the Class Search for current topic.

LIT 61S - Sacred Texts (5)

Studies religious texts held sacred by different cultures and communities around the world, concentrating primarily on their literary dimensions. Course topic changes; please see the Class Search for current topic.

LIT 61T - Travel Narratives (5)

Travel narratives may be of many types: odysseys of self-discovery, adventures in nature, or journeys to exotic lands off the beaten track. This course examines travelers' accounts drawn from periods ranging from the Middle Ages to the contemporary.

LIT 61U - Introduction to Speculative Fiction (5)

Examines speculative and science fiction (SF) texts to develop critical methods for the analysis and interpretation of SF as a critique of science, technology, and culture. Themes include encounters across species; novelty and change; expanded concepts of life; and the role of technology in human development.

LIT 61W - Writing and Research Methods (5)

Intensive training in the practice of literary analysis and the writing of polished research papers. Topics include manuscript sources, variant editions, reading techniques, publication technologies, web research. Workshop format. Strongly recommended for majors and/or transfer students who have completed LIT 1 or its equivalent.

LIT 61X - Tragedy: Learning Through Suffering (5)

Reading representative Greek tragedies with attention to history, form, and content. Course examines how Greek tragedy responds to the fact of human mortality, i.e., to the myriad and culturally specific ways in which characters in tragedy accept, evade, or deny death.

LIT 61Y - Arthurian Romance (5)

Reading of selected Arthurian romances in verse and prose from the French, Welsh, and English traditions.

LIT 61Z - Introduccion a generos literarios de Espana y America

Latina (5)

Speaking, reading, and writing proficiency in Spanish required. The study of poetry, drama, and prose in Spain and Latin America.

LIT 80B - Monsters and Literature (5)

Every age has the monsters it needs. From medieval marvels to GMO chimeras, monsters serve as figures of a culture's deepest fears, anxieties, and hidden desires. This course takes a multidisciplinary, transhistorical approach to the problems and promises of monsters, and introduces monster theory.

LIT 80D - Literary Traditions of India (5)

Introduces the fundamental questions of interpretation and cultural analysis through engagement with varying literary and cultural traditions of the Indian subcontinent since antiquity. Emphasis is on language, communicative media, literary form, memory, transmission, interpretive approaches, and translation. The course topics change; please see the Class Search for the current topic.

LIT 80E - Animals and Literature (5)

Examines the copresence in literary works (fiction and non-fiction prose and poetry) of nonhuman and human animals from antiquity to the present across a variety of cultures.

LIT 80H - The Politics of Fashion (5)

Surveys the politics of fashion, focusing on how style has shaped ideology, culture, power, revolution, resistance, and a variety of identities, including nation, race, ethnicity, gender, sexuality, and class.

LIT 80I - Topics in American Culture (5)

A history of one or more cultural genres in written, visual, and/or musical forms. Course topic changes; please see the Class Search for the current topic.

LIT 80K - Topics in Medical Humanities (5)

Medical Humanities designate an interdisciplinary field of humanities (literature, philosophy, ethics, history, and religion) concerned with application to medical education and practice. The humanities provide insight into the human condition, suffering, personhood, and our responsibility to each other; and offer a historical perspective on medical practice.

LIT 80L - The Holocaust: The Destruction of European Jewry (5)

Focus is on the destruction of the Jews of Europe by Nazi Germany. Issues are historically grounded, and include works of literature, social sciences, philosophy, and film.

LIT 80M - China in the Post-Reform Period (5)

Speaking, reading, and writing proficiency in Mandarin Chinese required. Lectures, discussions, writing assignments, and all readings in Chinese. An investigation of Chinese culture, society, and politics in the post-1978 period through literature, film, critical essays, and internet media. Topics include labor,

gender, generational divisions, family, urban life, social media, nationalism.

LIT 80N - Latino Expressions in the U.S (5)

An introduction to Latino literature and culture in the U.S. A study of the creative expressions of Chicanos/as, Nuyoricans, Cuban Americans, and other Latin Americans in the U.S.

LIT 80O - Love, Anarchy, Revolution (5)

Considers love, anarchy, and revolution as three modes of liberation. Concentrating on the contemporary period, with explorations of philosophy, literature, film, popular culture, political movements and manifestos, and personal or collective experience, this course considers these variant, but overlapping, scenes of the dialectics of liberation.

LIT 80Q - Jane the Virgin: Latinx Readers and (Latin) American Literature (5)

What does a telenovela spoof about a virgin Latinx mother and aspiring romance novelist have to do with literature? Course explores Jane the Virgin as a commentary on the tastes, identities, and politics of 21st-century Latinx readers and writers.

LIT 80T - Literature and Magic (5)

Explores the history of magic in relation to the written word. Concerns include the gendering of magic; interconnections among Judaic, Arabic, and Christian worlds; magic in the age of rationalism; and the recent popular fascination with magic.

LIT 80U - Introduction to Contemplative Reading (5)

Combines contemplative practice, including meditative practice, with close reading of literary works to provide students with a more precise ability to interpret and respond to texts, both literary and non-literary. Works include poetry, imaginative prose, and essays.

LIT 80V - Literature and History (5)

Examines literature's relationship to the past and to the experience of history. Course topic changes; please see the Class Search for current topic.

LIT 80W - Captive Minds: The Literature of Pre-modern Slavery (5)

Examines the literary production of slave societies by looking at the literatures of several pre-modern slave societies; also develops a cultural-historical narrative that explains the origins of genocidal forms of plantation slavery in the Americas by tracing their origins back to Greece and Rome.

LIT 80X - Global Narratives (5)

A survey of global narratives, with a focus on the novel over several centuries, traditions, languages, and cultures.

LIT 80Y - Harry Potter (5)

From The Sorcerer's Stone to The Deathly Hallows, this course approaches the Harry Potter books and films from a variety of

critical angles, using the analytical tools of literary and cultural studies to shed new light on this dizzying phenomenon.

LIT 80Z - Introduction to Shakespeare (5)

Study of representative plays. No previous experience with Shakespeare is assumed.

LIT 81A - Homer's Odyssey (5)

Introduction to Homer's Odyssey, its hero, and its world. An epic tale of a man who abandons his family to fight in the Trojan War, then returns two decades later, the Odyssey was a profound influence on the culture of ancient Greece and Rome, and continues to shape our self-understanding today.

LIT 81B - Literature and Photography (5)

Explores the close relationship between photography and literature, from the origins of photography to 19th-century realism and the contemporary photographic novel, interpreting photographs and literature to study how these fields influence each other and how their forms of representation relate.

LIT 81C - The Novels of Toni Morrison (5)

Examines novels by Toni Morrison, including *The Bluest Eye*, *Song of Solomon*, *Sula*, and *Jazz*, as sites of discontent and transformation, while also considering literary techniques such as form, voice, metaphor, and narrative structure. Includes discussion of Morrison's ideas about the intersection of race and sexuality, blackness as a shifting signifier, the role of the artist in society, and uses of literature for re-imagining the relationships between history, culture, and individuality.

LIT 81D - The Prophet and the Qur'an (5)

Introduction to the life of the Prophet Muhammad as a literary text and as a primary hermeneutic framework for understanding the Qur'an, including its relationship to a deep narrative prophetic tradition shared with other Abrahamic traditions.

LIT 81E - Social Media and Society (5)

Introduction to social media's evolving impact on society. How are social media changing communication, politics, identity, privacy, and what we believe? Materials include critical texts and real-world case studies, as well as films and short fiction.

LIT 81F - Ghosts of Slavery, 1960-80s/2000-20s (5)

Why does the history of slavery reappear at certain moments in literary and popular culture? Course focuses on the 1960s and the 2000s, when slavery was frequently featured in popular and academic history, fiction, film, and television, in both imaginative and documentary forms.

LIT 81G - The Good Life (5)

Do current social, political, and psychological conditions make it more difficult to live a good life? Drawing on the broad tradition of critical theory and utopian imaginings, the course aims to give practical and theoretical guidance toward achieving a good life.

LIT 81H - Literature and Pandemic: The World at the End of the

World (5)

Surveys some of the most famous accounts and representations of historical and fictional pandemics in the history of literature, mostly from the Western tradition. Students read excerpts from works by Thucydides, Lucretius, Boccaccio, Manzoni, Poe, Camus, London, and Elkhadem. Conversation centers on the question of how Western literature have attempted to both document and investigate the destruction of human society, but also to recreate it.

LIT 81I - Engineering California (5)

Online course using literary and artistic texts to investigate the history and engineering of California, and to imagine a virtual, material, and cultural infrastructure for California's future. Course begins and ends with the Internet, and includes topics such as cyberspace, the Gold Rush, Spanish/Mexican missions, wartime development, and early cybernetics.

LIT 87 - Introduction to Literary Topics (2)

Introduces topics in literature. The course topic changes; please see the Class Search for the current topic.

LIT 90 - Introduction to Creative Writing (5)

Introduction to the crafts and techniques of poetry, fiction, and creative non-fiction, identifying and exploring traditional and non-traditional literary forms and genres while working on individual creative writing projects. An author reading and two workshop sections per week.

Prerequisite: Prerequisite: satisfaction of the Entry Level Writing requirement. Enrollment is restricted to first-year students, sophomores, and juniors.

LIT 90X - Introduccion a la Escritura Creativa/Introduction to Creative Writing (5)

Speaking, reading, and writing proficiency in Spanish is required. Explores creative writing from a bilingual (Spanish-English) perspective, and considers bilingualism in the literary arts (como el ejercicio de una identidad), as a way of thinking and a way of being, as a creative lens (el pensamiento de frontera), as a framework, as a border (que quiere ser cruzada).

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing requirement. Enrollment is restricted to first-year, sophomore, and junior students.

LIT 91A - Intermediate Fiction/Prose Writing (5)

An intermediate-level course in fiction designed for prospective applicants to the creative writing concentration.

Prerequisite: Prerequisite(s): LIT 90.

LIT 91B - Intermediate Poetry Writing (5)

An intermediate-level course in poetry designed for prospective applicants to the creative writing concentration.

LIT 99A - Tutorial (5)

Study of literature in English or English translation. Students submit petition to sponsoring agency.

LIT 99B - Tutorial (5)

Speaking, reading, and writing proficiency in French, German, Greek, Italian, Latin, Spanish or other non-English language required. Students submit petition to sponsoring agency.

LIT 99C - Tutorial (5)

Study of creative writing. Students submit petition to sponsoring agency.

LIT 99F - Tutorial (2)

Students submit petition to sponsoring agency.

Upper-Division

LIT 101 - Theory and Interpretation (5)

Contemporary approaches to literary and cultural theory, with emphasis on how theoretical perspectives advance and broaden the reading of literary texts. Introduction to important new theoretical developments and their antecedents. Literature majors should complete this course as early as possible. Course topic changes; see the Class Search for the current topic.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to literature and proposed literature majors and literature minors.

LIT 102 - Translation Theory (5)

Promotes the understanding of translation and its role in redefining meanings across epochs and cultures, in establishing common norms, and in advancing mutual intelligibility; but also providing encounters with absolute alterity. Actual translations are used as case studies.

Prerequisite: Prerequisite(s): one year of college-level, non-English language study or the equivalent reading ability in a non-English language.

LIT 110A - The Traditional British Canon, Part I (5)

The constitution of the canon of English literature from Chaucer to Cowper. Critical approach designations: Canons, Histories. Distribution requirements: Poetry, Pre-1750.

LIT 110B - The Traditional British Canon, Part II (5)

Explores poetry and prose from 1800 to 1950 through extensive reading in the Romantics, Victorians, Moderns, articulating the connections among them, and connecting their work to key social, political, scientific, and technological moments defining these eras. Critical approach designations: Canons, Histories. Distribution requirement: Poetry.

LIT 110C - The Traditional U.S. Canon: Beginnings to 1900 (5)

Major works from the colonial and early national periods to 1900, with attention to their social and cultural context. Critical approach designations: Canons, Histories.

LIT 110D - The Traditional U.S. Canon, 1900 to the Present (5)

Major works from 1900 to the present, with attention to their social and cultural context. Critical approach designation: Canons, Histories.

LIT 111B - Geoffrey Chaucer (5)

Close study of Chaucer's poetry, with some attention to relevant cultural, philosophical, and historical issues in the context of the late medieval period. Particular emphasis on *The Canterbury Tales*. Critical approach designations: Canons, Histories. Distribution requirements: Poetry, Pre-1750.

LIT 111D - William Shakespeare (5)

Study of representative works by William Shakespeare. Course topic changes; please see the Class Search for the current topic. Critical approach designations: Canons, Media. Distribution requirements: Poetry, Pre-1750.

LIT 111E - Edmund Spenser (5)

Studies in Spenser's major poetry: *Faerie Queene*, Book I; *Epithalamion*; *Mutabilitie Cantos*. Critical approach designations: Canons, Histories. Distribution requirements: Poetry, Pre-1750.

LIT 112A - Jane Austen (5)

Representative Austen novels within political, historical, and cultural context; considers form and genre, nationalism, feminist, postcolonial, and other critical readings. Examines poetry and other writings that illuminate cultural issues of the period, as well as film and other adaptations of Austen's novels. Critical approach designations: Canons, Histories.

LIT 112C - Charles Dickens (5)

Study of representative work by Charles Dickens. Critical approach designations: Canons, Histories.

LIT 112E - Bob Dylan as Poet: From Folk Hero to Electric Messiah (5)

Focuses primarily on the poetry and poetics of Dylan's by now substantial canon of works--early, middle, and late. Stresses poetic syntax, various lyric genres, surrealist imagery, and narrative tactics used, as well as the more socially expansive dynamics of how Dylan forged his prophetic/visionary imagination.

LIT 112G - William Faulkner (5)

A survey of Faulkner's early fiction; focus on development of theme and technique. Also considers Faulkner as a Southern historian, stressing the relationship between personal and regional experience in time. Critical approach designations: Canons, Geographies.

LIT 112I - Kafka in Translation (5)

An intensive study of the works of Franz Kafka, with reference to the literary, social, and historical context in which his work emerged. Course topic changes; please see the Class Search for

current topic. Critical approach designations: Canons, Geographies.

LIT 112K - Herman Melville (5)

Study of representative work by Herman Melville, including novels and short stories. Critical approach designations: Canons, Histories.

LIT 112M - Twain (5)

A chronological survey of Twain's major works, with an emphasis on the development of style and content. Among other works, *The Innocents Abroad*, *Roughing It*, *Life on the Mississippi*, and *Huckleberry Finn* are considered. Critical approach designations: Canons, Power and Subjectivities.

LIT 112P - Gwendolyn Brooks (5)

An examination of the major works of Gwendolyn Brooks, the first African American to win the Pulitzer Prize (in 1950), with particular attention to questions of race, gender, and class as modes through which to consider questions of form and content. Critical approach designations: Canons, Power and Subjectivities. Distribution requirement: Poetry.

LIT 114A - Orlando Furioso (5)

Reading the 46-canto Italian Renaissance adventure poem of Ludovico Ariosto, the most popular book of its century and a classic of humanist literature, students consider literary tradition, Renaissance humanism, and how entertainment literature may articulate moral and political criticism. Critical approach designations: Canons, Genres. Distribution requirement: Poetry, Pre-1750.

LIT 114B - Don Quixote de la Mancha (5)

A close study of Books I and II of the Cervantes novel together with an examination of some of the criticism on this work written in English throughout the centuries. Critical approach designations: Canons, Histories. Distribution requirement: Pre-1750.

LIT 114C - Dante's Divine Comedy (5)

Reading of the *Inferno*, the *Purgatorio*, and selected *canti* of the *Paradiso*, along with selections from Dante's lyrics and from medieval Italian and French poetry. Critical approach designations: Canons, Genres. Distribution requirements: Poetry, Pre-1750.

LIT 114D - Goethe's Faust (5)

An intensive study of Goethe's *Faust*, Parts I and II. All works are read in English. Critical approach designations: Canons, Histories. Distribution requirement: Poetry.

LIT 114E - One Way Ticket to Hell ... and Back: Exploring Dante's *Inferno* (5)

Focuses on the *Inferno*, the first *cantica* of Dante Alighieri's *Divine Comedy*. Examines different uses of metamorphosis in Dante's representation of Hell, including the relationship between the ancient idea of human metamorphosis and Dante's representation of the Christian *contrappasso* (retribution), and

the medieval concept of *imago Dei* (in God's likeness). Critical approach designations: Canons, Power and Subjectivities. Distribution requirements: Poetry, Pre-1750.

LIT 114F - Finding Dante: A Reader's Guide to Getting Out of Hell (5)

An epic poem about a journey of self-discovery, Dante's *Comedy* challenges all assumptions about literary genres, styles, and the meaning of narrative and of life. Course covers Purgatory and Paradise. Critical approach designations: Canons, Histories. Distribution requirements: Poetry, Pre-1750.

LIT 116B - Encountering Antiquity (5)

Introduces selected modes and forms of poetry with emphasis on close textual analysis. Considers uses of Greek and Roman antiquity in English/Anglo-American poetic practice from early to post-modernity by historicizing the reproduction of antiquity through poetic forms. Critical approach designations: Canons, Genres. Distribution requirement: Poetry, Pre-1750.

LIT 116C - Ancient Myth/Modern Poetics (5)

Reading of Greek and Roman texts (in English translation) which utilize mythic material juxtaposed with later poems written in response to them. Readings from Homer, Sappho, Greek drama, Petrarch, modern poets; discussion of concepts of myth, strategies of response. Critical approach designations: Canons, Genres. Distribution requirement: Poetry, Pre-1750.

LIT 116F - Knights, Ladies, and Werewolves: Medieval French Literature in Translation (5)

Medieval French literature appeared rather suddenly in the the age of castles, Crusades, knights, and chivalry, and spawned a remarkable array of genres: epic, romance, lyric, *lais*, saint's lives, *fabliaux* (bawdy tales), drama, histories, and more. This course provides a sampling of the variety of this rich tradition. Critical approach designations: Canons, Histories. Distribution requirement: Pre-1750.

LIT 116G - Victorian Monsters (5)

Through an examination of monsters in literature, course explores anxieties, fears, and ideals of Victorian society, paying close attention to issues of gender, sexuality, class, race, empire, scientific, and technology. Critical approach designations: Canons, Histories.

LIT 116I - Philosophy in India (5)

Investigates various facets of premodern Indian thought. Emphasis of the course rotates and may fall upon metaphysics, epistemology, ontology, ethics, hermeneutics, or basic categories of Indian traditions (*dharma*, *karma*, *samsara*, *moksha*, etc.). Critical approach designations: Canons, Genres. Distribution requirement: Pre-1750.

LIT 117A - Old Iranian Literature (5)

The pre-Islamic literature of Iran is one of the world's richest literary traditions, and forms part of the Indo-European poetic heritage. Course offers an overview of and introduction to indigenous Iranian literary traditions. The course topic changes;

see the Class Search for the current topic. Critical approach designations: Canons, Histories. Distribution requirements: Global, Poetry, Pre-1750.

LIT 118A - Hebrew Bible (5)

Introduction to textual, source, redaction, historical, and literary criticism of individual books of the Hebrew Bible and to exegesis as science and ideology. Covers texts and iconography of neighboring mythological traditions (Mesopotamian, Ugaritic, Egyptian, Greek) when appropriate. Course topic changes; see the Class Search for current topic. Critical approach designations: Canons, Histories. Distribution requirement: Pre-1750.

LIT 120A - Topics in Poetry (5)

Close reading--critical and creative--of poetry. Examines how poets teach, through their writing, to radically attend to reading. The course topics changes; please see the Class Search for current topic. Critical approach designations: Genres, Histories. Distribution requirement: Poetry.

LIT 120B - Poetry of the 17th Century (5)

Readings in the works of Donne, Jonson, Herbert, Herrick, Marvell, and others. Critical approach designations: Genres, Histories. Distribution requirements: Poetry, Pre-1750.

LIT 120C - Victorian Poetry (5)

A reading of the major Victorian poets from Tennyson to early Yeats. Critical approach designations: Genres, Histories. Distribution requirement: Poetry.

LIT 120D - Nineteenth-Century American Poetry (5)

The major figures and important movements from Poe to Emerson through Whitman and Dickinson. Critical approach designations: Canons, Genres. Distribution requirement: Poetry.

LIT 120E - Early- to Mid-20th-Century American Poetry (5)

Poets include Emily Dickinson, Walt Whitman, H.D. (Hilda Doolittle), William Carlos Williams, Marianne Moore, Wallace Stevens, Langston Hughes, T.S. Eliot, and others, with attention to leading movements and critical issues. Critical approach designations: Canons. Genres. Distribution requirement: Poetry.

LIT 120F - Topics in Modern Poetry (5)

Survey of modern poetry; includes a variety of poetic forms. Course topic changes; see the Class Search for current topic. Critical approach designations: Genres, Histories. Distribution requirement: Poetry.

LIT 120H - American Poetry Since World War II (5)

Major poets since World War II, with attention to leading movements and critical issues. The course topic changes; please see the Class Search for the current topic. Critical approach designations: Genres, Histories. Distribution requirement: Poetry.

LIT 120J - Contemporary American Poetry (5)

Surveys contemporary poetry with attention to race, sex, and gender; includes a variety of poetic forms. Course topic changes; see the Class Search for the current topic. Critical approach designations: Genres, Histories. Distribution requirement: Poetry.

LIT 121D - Medieval Epic (5)

Medieval reworkings of stories and motifs drawn from the barbarian or Germanic tradition including Beowulf, The Song of Roland, Nibelungenlied, Snorri Sturlason: King Harald's Saga from Heimskringla, and Njal's Saga. Critical approach designations: Canons, Genres. Distribution requirement: Poetry, Pre-1750.

LIT 121G - The Idea of Poetry (5)

Focus is on the theories of rhetoric and poetry written between 1580 and 1620. Texts include English, Italian, French, and Spanish works. Critical approach designations: Genres, Histories. Distribution requirements: Poetry, Pre-1750.

LIT 121H - Classical Poetics in Elizabethan Verse (5)

An introduction to Elizabethan poetry and poetics, with emphasis on shorter lyrics (sonnets, ballads, etc.), pastoral, erotic epyllia, devotional poetry, etc. Examines various Classical and Continental strains of influence at play in the production of English verse in the later 16th century, including Classical rhetoric, Ovidian mythology, and Petrarchanism. Critical approach designations: Canons, Genres. Distribution requirements: Poetry, Pre-1750.

LIT 121J - Medieval Romance (5)

A study of representative texts from the 12th through the 15th centuries. Questions of subjectivity, sexuality, and history in romance narratives are addressed. Critical approach designations: Genres, Power and Subjectivities. Distribution requirement: Pre-1750.

LIT 121K - Radical Moderns/Poetry International (5)

Focuses on a generation of early 20th-century poets from Asia, Latin America, the Middle East, and beyond. Studying their poetic output through the lens of modernism and other genres, students discover a truly global moment in literature/politics. Critical approach designations: Genres, Power and Subjectivities. Distribution requirements: Global, Poetry.

LIT 121L - Green Ache: Eco-poetics, Race, and Material (5)

Examines eco-poetics as theory, politic, and field of discourse. Focuses on literary and artistic production across a variety of texts that explore the role of race and representation, including literary theory, film, and visual art. Critical approach designations: Genres, Power and Subjectivities. Distribution requirement: Poetry.

LIT 121M - Blue and Brown: Race, Gender, and Blackness (5)

Examines Blackness as race, identity, politic, field, and discourse. Exploration guided by poetry, narrative fiction, video, film, music, and the daily news. Critical approach

designations: Genres, Power and Subjectivities. Distribution requirement: Poetry.

LIT 121N - RAGE: Race and Performance (5)

Explores race, gender, and form in an interrogation of rage, and how it functions across an array of works by writers and artists in how they render rage's effects and configurations through poetry, prose, and performance. Critical approach designations: Genres, Power and Subjectivities. Distribution requirement: Poetry.

LIT 121O - Body Theories and Embodied Poetics in Contemporary American Poetry (5)

Course investigates the body as a site of political and theoretical significance in contemporary American poetry. Considers how and when corporeal poetics succeed (and fail) at capturing elusive and/or precarious subjectivities of race, sex, gender, grief, and violence. Critical approach designations: Genres, Media. Distribution requirement: Poetry.

LIT 121Q - Queer Lyrics: A History of LGBTQ Poetry in the United States (5)

Considers theories of sexuality and the lyric side-by-side, through readings, lectures, class discussions, and writing assignments. Questions of language, community, and self-hood inform discussions of a wide range of poets. Critical approach designations: Genres, Power and Subjectivities. Distribution requirement: Poetry.

LIT 123C - History of the Essay: From Seneca to Solnit (5)

Chronologically charts the essay's arc from the age of antiquity to the contemporary period. Considers how the genre has changed through time with attention to its form, language, and content.

LIT 124A - Masters of Modernist Short Fiction (5)

Acquaints students with the main stylistic features of modernism through the close reading of short stories. Critical approach designations: Genres, Histories.

LIT 124B - The Contemporary Latin American Short Story (5)

An exploration of the genres, forms, and history of the Latin American short story. Focus includes contemporary women writers and writers of color from throughout Latin America in dialogue with the Latin American short story tradition. Critical approach designations: Genres, Geographies. Distribution requirement: Global.

LIT 125A - Ancient Novel (5)

Roman prose fiction--the ancient novel and texts from other genres--in relation to the history of the novel. Critical approach designations: Genres, Histories. Distribution requirements: Pre-1750.

LIT 125B - Studies in the English Novel (5)

From the 18th to the 20th century. The course topic changes; please see the Class Search for the current topic. Critical approach designations: Genres, Geographies.

LIT 125C - Great French Novels (5)

Provides an introduction to important French novels of the nineteenth and twentieth centuries. All works are read in English. Critical approach designations: Genres, Geographies.

LIT 125D - Modern German Fiction (5)

Selected readings from the novel and novella in 20th-century German literature. All works are read in English. Critical approach designations: Genres, Histories.

LIT 125H - Modern Arabic Novel (5)

Examines the literary and cultural production of the modern Arab world, with an emphasis on the novel since the 1950s. Includes discussion of film, poetry, and mass culture. Critical approach designations: Genres, Histories. Distribution requirement: Global.

LIT 125I - What is the Novel? (5)

A survey of global narratives, focusing on the novel over several centuries, traditions, languages, and cultures. Examines the novel as a particular genre of literary expression; also examines its formative relationship with historical, social, cultural, and political processes. Critical approach designations: Genres, Power and Subjectivities. Distribution requirement: Global.

LIT 125J - French Science Fiction (5)

Considers several French literary and cinematic examples of contemplating the present through the future—and the past—that paint a shifting picture of how time makes us human. Course also examines the French novel as it has developed in conversation with scientific thought since the late-19th century. All works are read in English. Critical approach designations: Genres, Geographies.

LIT 126A - International Cyberpunk (5)

Cyberpunk, considered a subgenre within science fiction, has achieved international prominence and presents interesting interpretative challenges. Course examines some issues as manifested in representative texts. Critical approach designations: Genres, Histories. Distribution requirement: Global.

LIT 126F - Speculative Fiction As Cultural Theory and Practice (5)

Readings of contemporary and historical speculative fiction, including examination of representational practices, technologies, and politics that emerge from and/or circumscribe their interrelations. Course topic changes; please see the Class Search for current topic. Critical approach designations: Genres, Histories.

LIT 126G - Science Fiction and the Sublime: Science, Technology, and Subjectivity (5)

Studies the sublime encounter in works of science fiction literature and film. Lyotard defined the sublime as the "presentation of the unrepresentable." By examining what and who constitutes the sublime, we can explore relationships

among fundamental concepts like knowing, being, and embodiment. Critical approach designations: Genres, Media.

LIT 127D - Travel Writing (5)

Examines the genre of travel writing and the critical and cultural issues it engages. Critical approach designations: Genres, Geographies. Distribution requirements: Global.

LIT 130A - Ancient Literature in Cross-Cultural Perspective (5)

Comparative approaches to the study of ancient literature and culture. Topic changes; see the Class Search for current topic. Critical approach designations: Geographies, Histories. Distribution requirement: Global, Pre-1750.

LIT 130B - Travel Writing and Intercultural Relations in the Middle Ages (5)

Provides a historically-based and theoretically-informed introduction to medieval and early modern European contacts with other cultures. Readings include fourth through 17th-century writings about travel, discovery, and conquest in Asia, Africa, and America. Critical approach designations: Geographies, Histories. Distribution requirement: Global, Pre-1750.

LIT 130D - The Global Middle Ages (5)

Examination of texts from the global Middle Ages in a range of world cultures and traditions, with attention to their historical and social contexts. Course topic changes; please see the Class Search for the current topic. Satisfies the Global and Pre- and Early Modern distribution requirements.

LIT 131A - Problems (5)

Considers a range of phenomena from a critical world perspective: subject formation; human activity on a global scale; questions that demand a worlded answer. Course topic changes; see the Class Search for current topic. Critical approach designations: Geographies, Power and Subjectivities. Distribution requirement: Global.

LIT 131B - Space/Time (5)

The world as understood through spatial and temporal divisions: regions, nations, empires, periods in a worlded perspective. Course topic changes; see the Class Search for current topic. Critical approach designations: Geographies, Histories. Distribution requirement: Global.

LIT 131C - Worldings (5)

How to think about the world as a whole: representations, networks, systems, taxonomies, versions of globalization. Course topic changes; see the Class Search for current topic. Critical approach designations: Geographies, Histories. Distribution requirement: Global.

LIT 131D - Literature in a Global Context (5)

Comparative examination of fiction in the modern world and of fictional responses to social change and crisis. Course topic changes; see the Class Search for current topic. Critical

approach designations: Geographies, Power and Subjectivities. Distribution requirements: Global.

LIT 132A - Germany in War and Peace (5)

Study of selected texts reflecting German society at war or in that ambiguous state called peace. Attention is given to the place of literature in German cultural life and its special role in the formation of national identity. Critical approach designations: Geographies, Power and Subjectivities.

LIT 133D - Topics in the Literatures and Cultures of Southern Asia (5)

Provides in-depth analysis of literary and cultural phenomena of southern Asia. The course topic changes; see the Class Search for the current topic. Critical approach designations: Geographies, Histories. Distribution requirement: Global.

LIT 133E - Contemporary Chinese Society, Culture, and Politics (5)

Focuses on contemporary China: society, politics, culture, and the economy. Critical approach designations: Geographies, Histories. Distribution requirement: Global. (Formerly Topics in Asian Modernism.)

LIT 133F - Pacific Rim Discourse (5)

Examines the rise of the idea of the Pacific Rim: its historical background, ideological assumptions, and various forms of its cultural manifestations. Critical approach designations: Geographies, Histories. Distribution requirements: Global.

LIT 133G - The Nuclear Pacific (5)

Examines a range of cultural representations, literature, and films that chart the transnational history and representational legacy of uranium and nuclear power. Critical approach designations: Geographies, Histories. Distribution requirement: Global.

LIT 133H - Haunted by the Forgotten War: Literature and Film of the Korean War (5)

The Korean War has the dubious distinction of being known as the Forgotten War in a U.S. context. Course examines novels, short stories, film, popular visual narratives, and historical accounts of the Korean War and its often-circuitous legacies.

LIT 133I - Global Japan: Literatures of the Japanese Diaspora (5)

Examines the fiction of ethnic Japanese writers who are located outside of Japan. How do these writers situate themselves vis-a-vis Japan and the countries in which they were born or reside? How does their status as outsiders enable them to view Japan's social problems and colonial history? Critical approach designations: Genres, Geographies. Distribution requirement: Global.

LIT 134A - Caribbean Literature (5)

A study of major writing from the English-speaking Caribbean, with attention to the historical and cultural context out of which it arises and to which it responds. Critical approach

designations: Canons, Geographies. Distribution requirement: Global.

LIT 135A - Topics in African Literature (5)

Thematic and stylistic linkages: classical texts, oral traditions, and modern developments in African literature. Critical approach designations: Geographies, Power and Subjectivities. Distribution requirement: Global.

LIT 135E - The Historical Imaginary (5)

A survey of historical literature in the Americas that examines fictional attempts to re-imagine New World histories. Readings focus on secret or mangled histories, the legacies of slavery and colonialism, gendered critiques of national histories, and U.S. imperialism. Critical approach designations: Geographies, Power and Subjectivities. Distribution requirement: Global.

LIT 135F - Empire and After in the Anglophone Novel (5)

Examines fiction written in English, 1883 to 1948, in order to consider the complex relations--complicit, resistant, both--between literary and imperialist discourses. Likely novelists for study are Schreiner, Haggard, Conrad, Kipling, Forster, Hilton, Paton. Critical approach designations: Genres, Geographies.

LIT 135G - Postcolonial Writing (5)

Introduces students to a selection of postcolonial theory and texts. Critical approach designations: Geographies, Power and Subjectivities.

LIT 135H - African Futurisms (5)

Explores expressions of African futurism in a range of creative media--novels, short stories, and films--and analyzes them in conversation with theoretical texts. Recognizes African cultural producers and theorists as central to conversations about anti-colonialism, revolution, futurity, and the nonhuman and beyond human. Critical approach designations: Geographies, Power and Subjectivities. Distribution requirement: Global.

LIT 136B - Beat Literature and the World (5)

Explores the sources and context of Beat writing, emphasizing the Beats' intense interest in and engagement with the world at large. Includes works by major and minor Beat writers. Critical approach designations: Geographies, Power and Subjectivities. Distribution requirement: Poetry.

LIT 137A - Global Cities (5)

Examines cities as social spaces and as local spaces in the global economy and global imaginary. Focus is interdisciplinary, including literature, film, cultural studies, history, and sociology. Topic changes; please see the Class Search for current topic. Critical approach designations: Geographies, Histories. Distribution requirement: Global.

LIT 137C - Imagining Paris (5)

Examines ways in which Paris, France, a mecca of literature and art for the last two centuries, has spurred imagination, and has itself been the product of global imagination. Exploration of landmarks, monuments, and iconic aspects of Parisian culture

via literary and artistic imaginings. Critical approach designations: Geographies, Media.

LIT 138A - Culture and Nation (5)

Course explores the role of literature and culture in the production of national communities. Course topic changes; please see the Class Search for the current topic. Critical approach designations: Geographies, Histories. Distribution requirement: Global.

LIT 138B - Regions in American Literature (5)

Examines development of regional writing in the U.S. Course topic changes; see the Class Search for current topic. Critical approach designations: Geographies, Histories.

LIT 138C - Modern Turkish Literature (5)

Explores the formation of modern Turkish literature from the late-Ottoman tale to the postmodern novel. Introduces key critical concepts/debates (orientalism, canon formation, belatedness/modernization, national allegory) used in the study of non-Western literatures. Critical approach designations: Geographies, Histories. Distribution requirement: Global.

LIT 139A - Topics in American Literature and Culture (5)

Studies in American literature and culture, with attention to historical context. Course topic changes; please see the Class Search for current topic. Critical approach designations: Geographies, Histories.

LIT 139B - Los Angeles Circa 1992 (5)

In response to the acquittal of white police who brutally beat black motorist Rodney King, thousands of people took to the street. This course examines cultural narratives that arose in the lead-up to and aftermath of the 1992 L.A. uprising. Critical approach designations: Geographies, Power and Subjectivities.

LIT 141A - Early Mediterranean Cultures (5)

Examination of representations of medieval and early modern Mediterranean history. Course topic changes; please see the Class Search for current topic. Critical approach designations: Geographies, Histories. Distribution requirements: Global, Pre-1750.

LIT 141B - Classical Chinese Culture and Literature, 10th Century B.C.E. through Sixth Century C.E. (5)

Survey of writing and culture from the 10th century B.C.E. through the sixth century C.E., focusing on poetry, philosophical and historical writing, supernatural fiction, Buddhist/Taoist texts in contexts of fragmentation, empire building, dynastic collapse, rebellion, eremitism, and courtly society. Critical approach designations: Geographies, Histories. Distribution requirements: Global, Poetry, Pre-1750.

LIT 141C - Classical Chinese Culture and Literature, Sixth Century through 16th Century (5)

Survey of writing and culture from the Tang through early Ming dynasties (sixth century C.E. through 16th century C.E.). Themes include literary, religious, and philosophical

innovation; courtly life; cultural contacts with non-Chinese people; and transformations of state and society. Critical approach designations: Geographies, Histories. Distribution requirements: Global, Poetry, Pre-1750.

LIT 141D - Arab-Islamic Literatures I: 500-1200 (5)

Examines the development of classical Arabic literature in historical context, including the appearance and importance of major genres and their broad relationship to the social and cultural history of the Arab-Islamic world. Critical approach designations: Geographies, Histories. Distribution requirements: Global, Pre-1750.

LIT 141E - Arab-Islamic Literatures II: 1200-1900 (5)

Examines the evolution of Arabic and Islamic literatures and cultures through the late-Medieval and early-modern periods. These periods produce much of the body of literature and texts that survive today, and is profoundly influential. Critical approach designations: Geographies, Histories. Distribution requirements: Global, Pre-1750.

LIT 144A - Continental Renaissance (5)

Introductory survey of great prose writings of the continental Renaissance in their cultural and historical contexts. Authors include: Machiavelli, Castiglione, Erasmus, Rabelais, Montaigne, and Cervantes. Critical approach designations: Geographies, Histories. Distribution requirement: Pre-1750.

LIT 145A - Colonial American Literatures (5)

Surveys representations of the Euro-Amerindian encounter in the pre-national period. Readings include collective stories of indigenous peoples, European captivity narratives, reflections about spirituality and religion, poems, and a contemporary novel. Critical approach designations: Histories, Power and Subjectivities. Distribution requirement: Pre-1750.

LIT 146A - Studies in Romanticism (5)

A survey of major Romantic themes and authors between 1780 and 1820. Explores relationships to pre-Romantic and post-Romantic authors. The main goal is to achieve familiarity with a wide range of individual poems in the general context of Romanticism. Critical approach designations: Genres, Histories. Distribution requirement: Poetry.

LIT 146B - Victorian Literature (5)

British Victorian literature (1830-1901) featuring representative texts and authors. Course topic changes; please see the Class Search for the current topic. Critical approach designations: Geographies, Histories.

LIT 146C - Victorian Prose (5)

Victorian prophecy, Victorian criticism: an examination of some major writings of 19th-century nonfiction prose by Carlyle, Mill, Ruskin, Newman, Arnold, Pater, and Wilde, with a glance at the social context and the minor fictional forms of the era. Critical approach designations: Genres, Histories.

LIT 146D - Nineteenth-Century American Fiction (5)

Examination of selected fiction written between the end of the 18th century and the Civil War, with attention to historical and cultural as well as literary issues. Critical approach designations: Canons, Histories.

LIT 146F - The Dissenting Tradition in America (5)

Antislavery writing of the 19th century profoundly shaped a resistant strain in American writing. By reading speeches, essays, and life writing along with more traditionally literary work, students examine what gives language the power to move people and to change the world. Critical approach designations: Histories, Power and Subjectivities.

LIT 146G - Queer(y)ing Victorian Literature (5)

Examines mid- to late-19th-century English representations of non-normative gender and sexuality in popular culture. Considers how these figures in fiction conform to or resist established perceptions of gender, sexuality, race, and empire. Critical approach designations: Histories, Power and Subjectivities.

LIT 147A - Twain, Slavery, and the Literary Imagination (5)

Using Mark Twain's later writings and other literary/non-literary materials, explores responses to popular and legal discourse on blood, race, sex, resurgence of racism, and imperialism. Critical approach designations: Histories, Power and Subjectivities.

LIT 149A - Behind the Berlin Wall (5)

Examines cultural life in the German Democratic Republic between 1946 and 1992 through films from the state-owned DEFA film studios. Topics include: socialist realism and international modernism in cinema; the representation of collective labor; the status of women; youth culture; and the texture of everyday life and consumer culture in socialism. Critical approach designations: Histories, Media.

LIT 149B - Contemporary American Literature (5)

A selective examination of major writings since World War II, with attention to literary issues and historical context. Critical approach designation: Geographies, Histories.

LIT 149C - The 1960s (5)

An interdisciplinary study of the cultural and social movements of the 1960s. Critical approach designations: Histories, Power and Subjectivities. Distribution requirement: Global.

LIT 149D - Topics in Modern Literature (5)

Study of 19th- and/or 20th-century literature, with attention to its literary and historical context. Course topic changes; please see the Class Search for current topic. Critical approach designations: Genres, Histories.

LIT 149E - Modern Fiction and Poetry (5)

Survey of modern fiction and poetry. Course topic changes; please see the Class Search for current topic. Critical approach

designations: Genres, Histories. Distribution requirement: Poetry.

LIT 149F - Contemporary Mexican Narrative (5)

Examines 20th and 21st century Mexican literature, with attention to literary critical issues as they relate to cultural, historical, and political contexts. Critical approach designations: Geographies, Histories. Distribution requirement: Global.

LIT 149G - War in Contemporary American Culture (5)

Considers the treatment of war in American literature since World War II. Close attention paid to both literary form and historical context. Also provides perspectives on, and critical tools for thinking about, contemporary armed conflict. Course topic changes; please see the Class Search for the current topic. Critical approach designations: Histories, Power and Subjectivities.

LIT 149H - The Future (5)

Examines modes of thinking and imagining the future throughout human history, and considers the fate of the future today. Topics include apocalyptic religion, utopia and dystopia, progress, revolution, finance, and everyday life. Critical approach designations: Histories, Power and Subjectivities. Distribution requirement: Global.

LIT 149I - Contemporary Medievalisms (5)

Explores contemporary representations of medieval cultures by considering questions of historical memory, limits of adaptation, and the power of satire. Critical approach designations: Geographies, Histories.

LIT 149J - The Good Life (5)

The social, affective, and psychic structures of our neoliberal era make it difficult to live a good life. Drawing on the broad tradition of critical theory and utopian imaginings, the course aims to give practical and theoretical guidance toward achieving a good life.

LIT 150D - The Power of Writing: Books and Libraries 600-1500 (5)

Surveys the history of the book in the West from ca. 600-1500. Concentrates on the medieval illuminated manuscript and the first years of printing, and focuses on the relationship between text and image. Critical approach designations: Histories, Media. Distribution requirements: Pre-1750.

LIT 150E - Letters, Literature: A Correspondence Course (5)

Examines the form and function of the letter in literature from antiquity to the contemporary moment. Considers all writing, from the most expressly public to the most seemingly private, as a form of correspondence, and we will contribute our own letters, in both creative and critical modes, in an effort to expand our capacities for critical analysis of texts. Critical approach designations: Genres, Media.

LIT 151B - The Phenomenon of Tragedy (5)

Examines the theory of tragedy from Aristotle to Nietzsche, while inviting students to read and discuss classic dramatic pieces to which the label tragedy was applied. Relies on student presentations and contributions, and teaches skills both in handling theory and in practical literary criticism. Critical approach designations: Genres, Media. Distribution requirement: Pre-1750.

LIT 151G - English Drama: 1576-1642 (5)

Study of representative plays. Course topic changes; please see the Class Search for current topic. Critical approach designations: Canons, Media. Distribution requirement: Pre-1750.

LIT 151K - Gender, Race, and Disability in American Drama (5)

An investigation of how American playwrights represent and criticize the concepts of gender, race and disability. Analysis of the genre of drama as a contact zone of gender, race, and disability by studying how American playwrights have critically responded to historical and social alienation, sexism, racism, and ableism in their works about "disabled" bodies. Students cannot receive credit for this course and CRES 114. Critical approach designations: Media, Power and Subjectivities.

LIT 151L - Theater in India (5)

Historical introduction to the theatrical forms and dramatic performance styles that have characterized the Indian tradition at different times and places. Critical approach designations: Canons, Media. Distribution requirements: Global, Pre-1750.

LIT 154B - Literature and the Arts (5)

Literature and art challenge, collaborate with, and use each other as inspiration. Course examines the boundaries of and connections between literature and art; focuses on the relationship between self-expression, identity, and politics in art and literature. Critical approach designations: Media, Power and Subjectivities.

LIT 154C - Hip Hop Hi Art (5)

Explores the U.S. born and now global phenomenon hip hop as poetic discourse, and analytical frame by examining questions of race, gender, and sexuality via analysis of rap lyrics, music, visual art, video, film, and performance. Satisfies the Poetry distribution requirement.

LIT 155A - Cinema and Subjectivity (5)

An examination of the ways in which the technological and institutional practices of cinema construct modes of modern and contemporary subjectivity. Course topic changes; please see the Class Search for current topic. Critical approach designations: Media, Power and Subjectivities. Distribution requirement: Global.

LIT 155C - New German Cinema (5)

Surveys the work of Fassbinder, Kluge, Herzog, Schlöndorff, von Trotta, Reitz, Straub, Sanders-Brahms, and others. Major themes include post-fascism and the problems of history, the

burden of memory, mass culture, gender, social class, and migration in postwar Germany. Critical approach designations: Geographies, Media.

LIT 155D - Italian Cinema and Literature (5)

Explores the rich history of Italian cinema. Special attention is given to the links between literacy and visual narratives, Italian films and Italian novels, autobiographies, and short stories on which the films are based. Critical approach designations: Geographies, Media.

LIT 155E - Cinema and Social Change in Latin America (5)

Surveys selected Latin American and Latino feature and documentary films. Course topic changes; please see the Class Search for current topic. Critical approach designations: Media, Power and Subjectivities. Distribution requirement: Global.

LIT 155H - The Horror Film (5)

Shifting definitions of horror in the movies from the late silent period to the present through close analysis of representative films and critical texts. Course topic changes; please see the Class Search for current topic. Critical approach designations: Genres, Media.

LIT 155J - The Films of John Carpenter (5)

Study of development and central themes of preeminent genre director of the post-Hollywood era, concentrating on central core of major works in horror/science fiction genres from Halloween to In the Mouth of Madness, with attention to the comedies and action films. Critical approach designations: Genres, Media.

LIT 155L - Vampire Film (5)

Examines development and central themes of vampire film from the silent era to the present. Critical approach designations: Genres, Media.

LIT 155N - Cinema in India (5)

Examines cinema in India from the silent era to the contemporary production of Bollywood films. Attention is given to the rise of the culture industry in urban centers such as Mumbai, and the dialectical relationship between socio-political change and cultural form. Critical approach designations: Geographies, Media. Distribution requirement: Global.

LIT 155O - Women In/As Horror: Critical Approaches to the Horror Film (5)

What does horror film have to say about women? In treating horror film as text, students gain the necessary tools to read these movies as narrative; students also identify how race, class, gender, and genre function to create complex and challenging texts. Critical approach designations: Media, Power and Subjectivities.

LIT 156A - The Gothic Imagination in Fiction, Film, and Theory (5)

Readings include theoretical essays by Freud and Lacan and such fictions as The Monk, Frankenstein, Dracula, Maus, The

Yellow Wallpaper, and Beloved. Films change each year. Critical approach designations: Histories, Media.

LIT 156E - Mapping Fictions: Geocritical Approaches to Cultural Studies (5)

Studies how literature maps the world and in what ways our experiences of the world are informed by literary maps. Critical approach designations: Geographies, Media. Distribution requirement: Global.

LIT 157A - Modern Ancient Drama (5)

The study of 20th- and 21st-century productions and adaptations of ancient Greek drama in theater, dance, music, and film, including Stravinsky, Graham, Pasolini, Breuer, and von Trier, discussing artists' goals, the sociopolitical context, ideas of authenticity, and audience response. Critical approach designations: Histories, Media. Distribution requirement: Pre-1750.

LIT 157C - Representations of Hamlet (5)

Examination of Shakespeare's Hamlet from various perspectives, including as a literary and historical object, and as a mirror of socio-political concerns. Readings include both precursors to Shakespeare and modern adaptations and revisions of the Hamlet story. Critical approach designations: Canons, Media. Distribution requirements: Pre-1750.

LIT 157E - Greek Drama/Modern Film (5)

A reading of ancient Greek plays along with contemporary films similar to them in theme, form, and effect. Students discuss different definitions of tragedy; genre as a critical tool; and similarities and difference between the media of literature, drama, and film. Critical approach designations: Genres, Media. Distribution requirement: Pre-1750.

LIT 160C - Cruelty: Enjoying the Pain of Others (5)

Cruelty is the unmotivated infliction of pain on someone else. This course investigates the notion of cruelty cultures raised by Claude Levi-Strauss through the literatures of ancient Rome and 15th-16th century Mexico as well as contemporary world literature. Critical approach designations: Histories, Power and Subjectivities. Distribution requirements: Global, Pre-1750.

LIT 160E - Theorizing Race and Comics (5)

Examines comics' origins in the United States' legacies of racial caricature and political cartoons about slavery, Asian exclusion, yellow journalism, and imperial expansion. Analyses of graphic novel's 20th-century evolution around human-rights violations and post-atrocity representational strategies around race, nationalism and minority status. Critical approach designations: Media, Power and Subjectivities. Distribution requirement: Global.

LIT 160F - Topics in Cultural Studies (5)

Investigates the ways in which cultural texts--literary, aesthetic, visual, performative, and a variety of popular forms--create and transform individual experiences, everyday life, social relations, and power. Course topic changes; see the Class Search for the

current topic. Critical approach designations: Media, Power and Subjectivities.

LIT 160G - Topics in Literary Theory (5)

Examination of major issues in contemporary theory, with emphasis on key concepts. Course topic changes; please see the Class Search for current topic. Critical approach designations: Canons, Power and Subjectivities.

LIT 160I - Race, Militarism, and Empire in Asia and the Pacific (5)

Theoretical and historical inquiry into the relationship between race, militarism, and empire; a comparative examination of the Japanese and U.S. empires in the Asia-Pacific region; and a consideration of how liberal ideologies around race were wielded as a tool of imperial governance. Critical approach designations: Geographies, Power and Subjectivities. Distribution requirement: Global.

LIT 160J - Exile, Diaspora, Migration (5)

Analyzes how the figure of the refugee, migrant, and other travelling communities are produced, engaged and represented in literary texts, cultural texts, and theories. Course materials include fiction, memoir, essay, legal tracts, and film. Critical approach designations: Geographies, Power and Subjectivities. Distribution requirement: Global.

LIT 160K - Race, Labor, and Migration (5)

Examines racialized labor from the mid-19th century to the present, including the racial protest novel as a cultural form. Investigates race, gender, and citizenship as technologies used to regulate labor and to circumscribe labor's power. Critical approach designations: Histories, Power and Subjectivities. Distribution requirement: Global.

LIT 160L - Literature and Philosophy (5)

Provides critical insight into the complex dynamics that define our historical moment through an investigation of literary and philosophical treatments. Readings include novels, plays, philosophical essays, and political commentary. The course topic changes; see the Class Search for the current topic. Critical approach designations: Genres, Power and Subjectivities.

LIT 160M - The War on Terror (5)

Investigates the logic of U.S. imperialism, with a specific focus on the War on Terror. Includes texts in critical race and ethnic studies, history, and literature, and a diverse, range of media; novels, poetry, film, graphic literature, and music. Critical approach designations: Geographies, Power and Subjectivities. Distribution requirement: Global.

LIT 160N - John Brown: Prophet or Fanatic? (5)

John Brown was a 19th-century advocate of the use of armed insurrection to overthrow the institution of U.S. slavery. Why has a man dismissed as a fanatic been taken up as the subject of novels, biographies, popular songs, films, and even internet memes for the past 160 years? Course explores this question

through readings in literature, history, and theory. Critical approach designations: Histories, Power and Subjectivities.

LIT 160Q - (Gender)Queer Theories (5)

Examines theory and practice of (gender) queer- and trans-ness in the present historical moment. Drawing primarily on critical theory from trans and queer studies, alongside literary texts and popular culture, the course introduces intellectual and affective resources for navigating questions about gender non-normativity. Critical approach designations: Histories, Power and Subjectivities.

LIT 160R - Gangsters, Bandits and Rogues: The Image of the Outlaw from the Middle Ages to the Present (5)

Is the outlaw a revolutionary defender of the people? Or a pillager of the defenseless poor? A social outcast or a folk hero? This course explores the ambivalences and ambiguities of “the outlaw” in popular, literary, and historiographic representation. Distribution requirements: Pre-1750.

LIT 160S - Cultures of Socialism (5)

Emphasizes socialism as an important aspect of modernity. Beginning with an overview of the left avant-gardes of the early 20th century, students look at the debates about the political implications of realism, modernism, and socialist realism.

LIT 161A - African American Literature (5)

Examination of African American writing and cultural representations, with attention to the historical, cultural, and general literary contexts out of which they emerged and upon which they commented. Course topic changes; please see the Class Search for the current topic. Critical approach designations: Histories, Power and Subjectivities.

LIT 161B - African American Women Writers (5)

Explores the cultural, aesthetic, political, and feminist issues in select works by African American women. Through close analysis of the works, students develop an understanding of the intersections that race, gender, and class play in the literary imaginations of these writers. Critical approach designations: Histories, Power and Subjectivities.

LIT 162A - Asian American Literature (5)

Examination of Asian American literary works (fiction, poetry, dramatic essays) in the context of the historical presence of Asian Americans in the United States since the 1850s. Emphasis on comparison of select works from ethnic Asian writings. Critical approach designations: Geographies, Power and Subjectivities.

LIT 162B - Literature of the Asian Diaspora (5)

Study of literature of the Asian diaspora, attempting to discover and define a growing body of contemporary writing under this rubric, including immigrant/migrant histories, memories of exile and refuge, as well as the fiction of imagined homelands. Critical approach designations: Geographies, Power and Subjectivities. Distribution requirement: Global.

LIT 162C - So Many Little Lives: Representations of Trauma in

Asian American Literature (5)

Explores representations of trauma in contemporary Asian American literature. Critical approach designations: Geographies, Power and Subjectivities.

LIT 163A - American Indian Literature (5)

Explores works of fiction, creative non-fiction, drama, and poetry written by American Indians. Focuses on historical and political issues within the text as well as on formal and thematic structures. Critical approach designations: Histories, Power and Subjectivities.

LIT 164A - Jewish Travel Narratives (5)

Exploration of the idea of the Diaspora as a moving condition, and of the multi-dimensional character of global Jewish culture, covering authors who traveled across the Jewish world from medieval times to the present. Critical approach designations: Geographies, Power and Subjectivities. Distribution requirement: Pre-1750.

LIT 164B - Hebrew Poetry (5)

Hebrew poetry-Biblical, medieval, modern-explores cultural and literary issues central to our contemporary world. Texts and discussion focus on Jewish and Israeli literary traditions. Critical approach designations: Genres, Power and Subjectivities. Distribution requirement: Poetry.

LIT 164C - Global Jewish Writing (5)

Comparative analysis of modern Jewish writers from Western and non-Western diasporas. Critical approach designations: Geographies, Power and Subjectivities. Distribution requirement: Global.

LIT 164D - Jewish Diaspora, Ethnicity, and Urban Life (5)

Focuses on modern Jewish diaspora, ethnicity, and urban life. Critical approach designations: Geographies, Power and Subjectivities.

LIT 164G - Literature and the Holocaust (5)

Reading and analysis of fiction and poetry, focusing on Holocaust literature as a problem in critical theory, cultural studies, and literary history. Though most of the works are read in translation, some knowledge of European languages is helpful. Critical approach designations: Histories, Power and Subjectivities.

LIT 164H - Jewish Writers and the European City (5)

Interrogates the master narrative of a specific European city and discusses the ways in which Jewish life and Jewish actions helped to shape that story and were shaped by it. Course topic changes; please see the Class Search for current topic. Critical approach designations: Geographies, Power and Subjectivities.

LIT 164J - Jewish Writers and the American City (5)

An examination of some major Jewish writers and their responses to the American city. Major writers: Henry Roth, Saul Bellow, Bernard Malamud, J. Kaplan, Philip Roth. A look

at Yiddish and other minority writers, and including sociological and historical materials on the American city. The course topic changes; please see the Class Search for the current topic. Critical approach designations: Histories, Power and Subjectivities.

LIT 164K - Jewish Comedy (5)

Examines literary, theatrical, cinematic, and televised representations of Jewish culture, focusing on the ways in which Jews have negotiated the transition to modernity via comedy and humor. Critical approach designations: Media, Power and Subjectivities.

LIT 165A - Chicano/Mexicano Geographies (5)

Considers the historical, current, and future directions of Chicano/a literary culture within the context of the long-standing exchanges of culture and politics across the U.S.-Mexican border and the challenges of globalization. Includes novels, essays, and films. Critical approach designations: Geographies, Power and Subjectivities. Distribution requirement: Global.

LIT 165B - Latino Fictions of the Americas (5)

Writers in the U.S., Latin America, and the Caribbean have been drawn repeatedly to the theme of intercultural conflict as they recall the traumatic history of the hemisphere. Examining fiction, poetry, and film expands the horizons of American literature. Critical approach designations: Genres, Power and Subjectivities. Distribution requirement: Global. (Formerly Latin/o American Fiction.)

LIT 165C - Mesoamerican Indigenous/Indigenista Literature (5)

Analyzes literature about and by indigenous peoples in Mesoamerica: traces the construction of racialized categories of identity, such as indio and mestizo in Mesoamerican cultures and examines how they interact with definitions of the human that dominate in the West. Critical approach designations: Histories, Power and Subjectivities. Distribution requirement: Global.

LIT 166A - Representations of Gender in Medieval Literature (5)

Examination of the portrayal of gender roles and interactions. Particular stress on erotic experience and the courtly tradition: Ovid, Andreas Capellanus, Marie de France, Chretien de Troyes, The Romance of the Rose, Dante, Chaucer, Christine de Pizan. Critical approach designations: Histories, Power and Subjectivities. Distribution requirements: Poetry, Pre-1750.

LIT 166B - Early Modern Representations of Gender (5)

Explores representation of gender in early modern literature, with attention to contemporary aesthetic, cultural, and theoretical contexts. Texts include drama, poetry, and prose. Critical approach designations: Histories, Power and Subjectivities. Distribution requirement: Pre-1750.

LIT 166C - Early Modern Italian Women Writers (5)

In early modern Italy several factors converged to foster a boom in women's writing and publication. Course addresses the

context and content of these writings, dealing with key theoretical and historical issues surrounding women's entry into authorship in Europe. Knowledge of Italian not required. Critical approach designations: Geographies, Power and Subjectivities. Distribution requirement: Pre-1750.

LIT 166E - Women's Literature (5)

Works by women from the 18th century to the present, with special attention to the relationship of literature to history, psychology, and aesthetics. Course topic changes; please see the Class Search for current topic. Critical approach designations: Histories, Power and Subjectivities.

LIT 167B - Monsters and Humans (5)

Focuses on the historical development of what we broadly consider to be the human body from its Humanist instantiations in early modern Europe as seen through its alleged opposite: the monstrous body. Critical approach designations: Histories, Power and Subjectivities. Distribution requirement: Pre-1750.

LIT 167C - Metamorphoses: Pre/Post Modern Transformations (5)

Examines transformations between god, human, and animal from ancient literature to medieval, renaissance, modern, and postmodern (especially science) fiction and poetry. Critical approach designations: Histories, Power and Subjectivities. Distribution requirement: Poetry, Pre-1750.

LIT 167E - The Vampire in Literature and Popular Culture (5)

Traces the vampire's appearance in different historical moments, cultural contexts, genres, and media to interrogate its place in the shifting cultural politics of gender and sexuality, as well as in relation to race, ethnicity, class, and other identity positions. Critical approach designations: Media, Power and Subjectivities.

LIT 167F - Animals and Literature (5)

Examines the disruptive presences of nonhuman animals and nonanimal aliens as they appear in a variety of narrative forms: prose fiction, non-fiction, and poetry. Organized around central themes relating to the presence of animals in literature, including representation, difference, desire, and subjectivity. Critical approach designations: Histories, Power and Subjectivities.

LIT 167G - Reading the Weather: Literature and Global Climate Change (5)

An overview of climate change and its representations in literary and filmic texts. Asks how climate fiction and non-fiction narratives of climate change can help us to confront issues of environmental justice, inequalities of race and class, vulnerability, land rights, and refugeehood. Critical approach designations: Geographies, Power and Subjectivities. Distribution requirement: Global.

LIT 167H - Disability in Transnational Asian American Studies

(5)

Investigates U.S. imperialism in the Asia-Pacific region by focusing on race and disability; examines how disabled subjects have responded to historical and social alienation. Critical approach designations: Geographies, Power and Subjectivities. Distribution requirement: Global.

LIT 167I - The Environmental Humanities (5)

Explores how literary works and other cultural products have represented and defined relationships among the living and nonliving in the environment. Topics include the history of ideas about the nature/culture divide, the interconnectedness of life and non-life, and sustainability and reciprocity in ecological crisis.

LIT 168A - The Culture of Islamic Law (5)

Investigates the nature of Islamic law as a set of textual and interpretive practices that change over time and is fully enmeshed with Arabic culture, as well as its representation and role in literature as a force, standard, and context. Critical approach designations: Genres, Power and Subjectivities. Distribution requirement: Global.

LIT 168B - Islamic Law and Society (5)

Introduction to Islamic Law and its development as a set of discursive practices and institutional formations, from its origins to its transformation by modern state systems. Focuses on development of legal theory as textual interpretation and translation into social practice. Critical approach designations: Histories, Power and Subjectivities. Distribution requirement: Global.

LIT 169A - White Flow(n): Race, Gender, and Material (5)

Examines the question of whiteness as race, identity, politic, and field of discourse, focusing on cultural literary and artistic production from the 1990s that brought about the field of critical white studies. Includes prose, poetry, literary theory, film, and visual art. Critical approach designations: Genres, Power and Subjectivities.

LIT 179A - Advanced Writing: Fiction (5)

Intensive work in writing fiction. Critical approach designation: Genres.

Prerequisite: Enrollment is restricted to creative writing literature majors.

LIT 179B - Advanced Writing: Poetry (5)

Intensive work in writing poetry. Critical approach designation: Genres.

Prerequisite: Enrollment is restricted to creative writing literature majors.

LIT 179C - Methods and Materials (5)

Focuses on a particular process or subject used in the production of a literary text. Course is intended to work as a bridge between invention and scholarship. Course topic

changes; please see the Class Search for current topic. Critical approach designation: Genres.

Prerequisite: Enrollment is restricted to creative writing literature majors.

LIT 181A - Biblical Hebrew, Part 1 (5)

Grammatical study interspersed with narrative excerpts from the Hebrew Bible. Recommended: previous study of a second language up to the advanced level. Critical approach designations: Canons, Histories. Distribution requirements: Global, Pre-1750.

LIT 181B - Biblical Hebrew, Part 2 (5)

Continuation of grammatical study interspersed with poetic texts from the Hebrew Bible. Critical approach designations: Genres, Geographies. Distribution requirements: Global, Poetry, Pre-1750. Together, Biblical Hebrew 1 and Hebrew 2 fulfill the language prerequisites for LIT 102; together they also satisfy the intensive major second-language course requirements.

Prerequisite: Prerequisite(s): LIT 181A or the equivalent.

LIT 181C - Coptic (5)

Intensive introduction to fundamentals of classical Coptic grammar (Sahidic dialect) designed to move rapidly into reading of primary texts. Readings include The Martyrdom of S. Coluthus, Gospel of Thomas, and the Gnostic treatise Thunder: Perfect Mind. Critical approach designations: Genres, Histories. Distribution requirement: Pre-1750.

LIT 181D - Reading Egyptian Hieroglyphs, Part 1 (5)

Introduction to Egyptian hieroglyphs as a graphic, conceptual, and communicative system. Covers the basic elements of classical Egyptian grammar, drawing primarily on inscriptions from extant Egyptian monuments. Students read one prose and one poetical text from the Middle Kingdom. Critical approach designations: Geographies, Media. Distribution requirement: Global, Pre-1750. Strongly recommended: two years previous study of a foreign language at the college level or the equivalent.

LIT 181E - Reading Egyptian Hieroglyphs, Part 2 (5)

Advanced Middle Egyptian grammar (two weeks). Close reading of the Tale of Sinuhe in Middle Egyptian, selected hymns and love poetry from the New Kingdom. Critical approach designations: Genres, Geographies. Distribution requirement: Global, Poetry, Pre-1750. Together, LIT 181D and LIT 181E, Egyptian Hieroglyphs 1 and 2, fulfill the language prerequisites for LIT 102; together they also satisfy the intensive major second-language course requirements.

Prerequisite: Prerequisite(s): LIT 181D.

LIT 181F - Reading Egyptian Hieroglyphs, Part 3 (5)

Close reading of the Tale of Sinuhe in Middle Egyptian. Critical approach designations: Genres, Geographies. Distribution requirements: Global, Poetry, Pre-1750.

Prerequisite: Prerequisite(s): LIT 181E.

LIT 181G - Sanskrit, Part 1 (5)

Systematic introduction to the grammar, syntax, and usage of Classical Sanskrit, to the oral dimensions of the language, and to the Sanskrit literary tradition. Critical approach designations: Canons, Histories. Distribution requirements: Global, Poetry, Pre-1750.

LIT 181H - Sanskrit, Part 2 (5)

Continued study of the grammar, syntax, and usage of Classical Sanskrit, and the Sanskrit literary tradition. Students read the entire Bhagavad-Gita, including key sections in the original Sanskrit. Critical approach designations: Canons, Geographies. Distribution requirements: Global, Poetry, Pre-1750. Together, LIT 181G and LIT 181H, Sanskrit Parts 1 and 2, fulfill the language prerequisites for Literature 102; together they also satisfy the intensive major second-language course requirements.

Prerequisite: Prerequisite(s): LIT 181G.

LIT 182A - Le Moyen Age (5)

Speaking, reading, and writing proficiency in French required. Study of 12th- and 13th-century texts, with attention to problems of history and social change. In modern translations with selected readings in Old French or Provençal. Course topic changes; see the Class Search for current topic. Critical approach designations: Geographies, Histories. Distribution requirements: Poetry, Pre-1750.

LIT 182E - Etudes de Poésie (5)

Speaking, reading, and writing proficiency in French required. Emphasizes the close study of a limited number of poetic texts in terms of their linguistic, stylistic, and rhetorical devices. Course topic changes; please see Class Search for current topic. Critical approach designations: Genres, Geographies. Distribution requirement: Poetry.

LIT 182F - Le théâtre (5)

Speaking, reading, and writing proficiency in French required. Studies in French drama and theories of theatricality. Course topic changes; see the Class Search for current topic. Critical approach designations: Genres, Media.

LIT 182H - Auteur et culture (5)

Speaking, reading, and writing proficiency in French required. Designed to provide an in-depth study of a given author's literary oeuvre and its cultural context. Course topic changes; see the Class Search for the current topic. Critical approach designations: Geographies, Histories.

LIT 182I - Littérature d'expression française hors de France (5)

Speaking, reading, and writing proficiency in French required. A study of texts written in French-speaking cultures: Belgium, Canada, Africa, the Caribbean. Critical approach designations: Geographies, Histories. Distribution requirement: Global.

LIT 182J - Theorie (5)

Speaking, reading, and writing proficiency in French required. A discussion of recent developments in French literary theory. Critical approach designations: Canons, Geographies.

LIT 182K - Textes et contextes (5)

Speaking, reading, and writing proficiency in French required. Examines implications of social and political change in terms of literary theory and practice. Places equal emphasis on literary and other kinds of cultural texts: historical, political, and cinematic. Course topic changes; please see the Class Search for current topic. Critical approach designations: Histories, Power and Subjectivities.

LIT 182L - Science-Fiction Française (5)

Speaking, reading, and writing proficiency in French required. Course considers several French literary and cinematic examples of contemplating the present through the future and the past. Learn how reading across different cultural contexts can blur the distinction between "science" and "fiction"; how to read fictional texts alongside the films they inspire; and how to produce more effective essays and presentations in French. Critical approach designations: Genres, Media.

LIT 183A - Einführung in der deutschen Literatur (5)

Speaking, reading, and writing proficiency in German required. Wide reading of works representing the major authors, periods, and genres of German literature. Critical approach designations: Canons, Geographies.

LIT 183B - Themen in deutscher Literatur und Kultur (5)

Speaking, reading, and writing proficiency in German required. Course studies German literature and culture, with attention to historical context. Course topic changes; please see the Class Search for current topic. Critical approach designations: Geographies, Histories.

LIT 183D - Die deutsche Romantik (5)

Speaking, reading, and writing proficiency in German required. A study of the emergence and development of German Romanticism. Central concerns are the Romantics' attitude toward the role of the imagination in literature and their attempts to revitalize myth and folklore in their works. Authors read include Tieck, Novalis, Hoffmann, Eichendorff, and Heine. Critical approach designations: Genres, Histories.

LIT 183F - Die deutsche Novelle (5)

Speaking, reading, and writing proficiency in German required. A study of Novellen of the major 19th-century German authors. Critical approach designations: Canons, Genres.

LIT 183G - Deutsche Komödie (5)

Speaking, reading, and writing proficiency in German required. A study of a series of comic works by authors writing in German. In addition to discussing the texts in depth, we also look at theories of humor and laughter developed by thinkers such as Freud, Schopenhauer, and Bergson. Critical approach designations: Canons, Media.

LIT 183H - Das deutsche Drama (5)

Speaking, reading, and writing proficiency in German required. Selected readings of major German dramatists; attention given to various movements in theater. Critical approach designations: Canons, Media.

LIT 183I - Deutscher Film: Geschichte, Kultur, Gesellschaft (5)

Speaking, reading, and writing proficiency in German required. Course plots the thematic and formal trajectories of cinema in the German Democratic Republic between 1946 and 1992 to examine the key stress lines of socialist culture in East Germany. Critical approach designations: Histories, Media. (Formerly German Cinema: History, Culture, and Society.)

LIT 183K - Moderne deutsche Literatur und Film (5)

Speaking, reading, and writing proficiency in German required. Discusses a range of modern and contemporary German texts, including poetry, drama, and film. Critical approach designations: Geographies, Media.

LIT 183M - Moderne deutsche Fiktion (5)

Speaking, reading, and writing proficiency in German required. Selected readings from the novel and novella in 20th-century German literature. Critical approach designations: Genres, Geographies.

LIT 183N - Modern Deutsche Lyrik (5)

Speaking, reading, and writing proficiency in German required. Intensive analysis of selected poems is complemented by broader reading in certain authors and periods. Critical approach designations: Genres, Histories. Distribution requirement: Poetry.

LIT 183P - Fremdenangst: Ausländerfeindlichkeit in der deutschen Literatur und Kultur (5)

Speaking, reading, and writing proficiency in German required. Considers recent violence against immigrants and asylum-seekers in Germany, and moves on to examine images of people perceived as foreign or alien in German literature and culture from early times to the present. Critical approach designations: Genres, Power and Subjectivities.

LIT 184A - Introduction to Greek Literature (5)

Reading proficiency in Ancient Greek required. Critical approach designations: Canons, Histories. Distribution requirement: Pre-1750.

LIT 184B - Greek Drama (5)

Reading proficiency in Ancient Greek required. Course topic changes; see the Class Search for current topic. Critical approach designations: Histories, Media. Distribution requirement: Pre-1750.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

LIT 184C - Greek Poetry (5)

Reading proficiency in Ancient Greek required. Course topic changes; see the Class Search for current topic. Critical approach designations: Genres, Histories. Distribution requirements: Poetry, Pre-1750.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

LIT 184D - Prose Authors (5)

Reading proficiency in Ancient Greek required. Course topic changes; see Class Search for the current topic. Critical approach designations: Canons, Genres. Distribution requirement: Pre-1750.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

LIT 184E - Special Topics in Greek Literature (5)

Reading proficiency in Ancient Greek required. Readings in selected ancient Greek texts. Course topic changes; see the Class Search for current topic. Focus is on translation and interpretation; requirements normally include translation exams and interpretive essays. Critical approach designations: Canons, Genres. Distribution requirements: Global, Pre-1750.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

LIT 185B - Letteratura e cultura italiana (5)

Speaking, reading, and writing proficiency in Italian required. In-depth examination of a topic in Italian literary and cultural studies. Course topic changes; see the Class Search for current topic. Critical approach designations: Geographies, Histories.

LIT 185H - L'Opera italiana (5)

Speaking, reading, and writing proficiency in Italian required. Explores Italian opera as dramatic and spectacular cross-cultural phenomenon beginning in 1590s Florence through the 19th and 20th centuries. Attention to opera's function as a medium of cultural translation and political critique. Critical approach designations: Genres, Media. Prerequisite(s): Two years of university study of Italian language, or equivalent proficiency.

LIT 185I - Teatro italiano (5)

Speaking, reading, and writing proficiency in Italian required. Survey of Italian theater from its beginnings in medieval ritual through the development of Renaissance staged comedy and the commedia dell'arte, pastoral and tragicomedy, opera, melodrama, and 20th-century avant-garde and political theater. Critical approach designations: Genres, Media.

LIT 185J - Poesia moderna (5)

Speaking, reading, and writing proficiency in Italian required. Study of development of the Italian lyric from romanticism to present, with close stylistic and thematic analyses of works of Leopardi, D'Annunzio, Ungaretti, Quasimodo, Pavese, and

Montale. Critical approach designations: Canons, Genres.
Distribution requirement: Poetry.

LIT 185L - La novella italiana (5)

Speaking, reading, and writing proficiency in Italian required. Surveys short fiction in Italian, from bawdy medieval novellas to folk tales edited in the 19th century, to psychological and character studies. Focuses on the formal properties that distinguish short fiction from romances and novels and the social functions these writings can perform. Critical approach designations: Genres, Geographies.

LIT 185M - Fascismo e resistenza (5)

Speaking, reading, and writing proficiency in Italian required. The relationship between literature and Italian fascism is explored, including the rise and myths of fascism, critique and censorship, the persecution of minorities, the Resistance, the role of the intellectual. Authors include Borgese, Vittorini, Bassani, Pavese. Critical approach designations: Histories, Power and Subjectivities.

LIT 185N - Le donne nell'Italia moderna (5)

Speaking, reading, and writing proficiency in Italian required. Explores the specificity of Italian women's writing and studies their literary activities in historical and social context. Readings include Italian feminist and some history as well as literary texts. Critical approach designations: Geographies, Power and Subjectivities.

LIT 185O - "I need a hero:" Ariosto's (Un)Epic Renaissance (5)

Speaking, reading, and writing proficiency in Italian required. In this course, we will study the Italian Renaissance adventure poem by Ludovico Ariosto, *Orlando Furioso* (1532) and we will use it to penetrate the cultural, spiritual, and political tensions that marked the passage from pre- to early-modernity in the West. Distribution requirements: Poetry, Pre-1750.

LIT 185P - Boccaccio: Decameron (5)

Speaking, reading, and writing proficiency in Italian required. Critical study of *The Decameron*. Critical approach designation: Canons, Genres. Distribution requirements: Poetry, Pre-1750.

LIT 185Q - Dante: *Divina Commedia* (5)

Speaking, reading, and writing proficiency in Italian required. Reading of the *Inferno*, the *Purgatorio*, and selected *canti* of the *Paradiso*, along with selections from Dante's lyrics and from medieval Italian and French poetry. Critical approach designations: Canons, Histories. Distribution requirements: Poetry, Pre-1750.

LIT 185S - Petrarca (5)

Speaking, reading, and writing proficiency in Italian required. The transition from medieval to Renaissance modes of poetry in the works of Francesco Petrarca. Readings in the *Rime Sparse*, the *Trionfi*, and the prose works. Critical approach designations: Canons, Histories. Distribution requirements: Poetry, Pre-1750.

LIT 185Z - Italian Studies Writing in the Discipline (1)

Concurrent enrollment in an approved upper-division course in Italian literature, history of art and visual culture, or history satisfies the Disciplinary Communication requirement in Italian studies. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Students submit petition to sponsoring agency. Enrollment restricted to Italian studies majors and by permission of instructor.

LIT 186A - Introduction to Latin Literature (5)

Reading proficiency in Latin required. Course topic changes; see Class Search for the current topic. Critical approach designations: Canons, Histories. Distribution requirement: Pre-1750.

LIT 186B - Roman Poetry (5)

Reading proficiency in Latin required. Course topic changes; see the Class Search for current topic. Critical approach designations: Canons, Genres. Distribution requirements: Poetry, Pre-1750.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

LIT 186C - Prose Authors (5)

Reading proficiency in Latin required. Course topic changes; see the Class Search for current topic. Critical approach designations: Canons, Histories. Distribution requirement: Pre-1750.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

LIT 186D - Special Topics in Latin Literature (5)

Reading proficiency in Latin required. Course topic changes; see the Class Search for current topic. Critical approach designations: Geographies, Histories. Distribution requirement: Pre-1750.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

LIT 188A - *Literatura medieval* (5)

Speaking, reading, and writing proficiency in Spanish required. Focuses on Spanish medieval literature, broadly covering the 12th to the 15th centuries. Examines and contextualizes literary genres developed in this period. Critical approach designations: Geographies, Histories. Distribution requirement: Pre-1750. (Formerly Medieval Spanish Literature.)

LIT 188B - *Literatura peninsular: de los orígenes al siglo XVIII* (5)

Speaking, reading, and writing proficiency in Spanish required. A critical study of several representative texts from the early period of Spanish literature in their sociohistorical context. Included among the readings are *El Poema del Cid*, the *Romancero*, *La Celestina*, *Lazarillo de Tormes*, and a Golden Age play. Critical approach designations: Geographies, Histories. Distribution requirements: Poetry, Pre-1750.

LIT 188E - Teatro del Siglo de Oro español (5)

Speaking, reading, and writing proficiency in Spanish required. Studies in Spanish Golden Age theater. Critical approach designations: Histories, Media. Distribution requirement: Pre-1750.

LIT 188F - Cuentos del Siglo de Oro español (5)

Speaking, reading, and writing proficiency in Spanish required. Focuses on the prose in the Renaissance period and the different genres that flourished before the creation of Cervantes' Don Quixote. Chosen texts constitute an amalgam of Renaissance ideology, and provide examples of 16th-century literature, including the picaresque novel, pastoral novel, the Byzantine novel, and the chivalresque novel. Critical approach designations: Genres, Histories. Distribution requirement: Pre-1750.

LIT 188G - Literaturay vida en Don Quijote y otros textos cervantinos (5)

Speaking, reading, and writing proficiency in Spanish required. A close reading of the works of Cervantes, with particular attention to Don Quijote, in an attempt to discover how these works reflect the conflictive period in which the author lived. Also looks closely at the Cervantine view of the relationship of literature to life, as manifested in the works under study. Critical approach designations: Canons, Histories. Distribution requirement: Pre-1750.

LIT 188H - Erotismo y Mística (5)

Speaking, reading, and writing proficiency in Spanish required. Examines the connections between erotic literature and mystical literature through poetic representations of sublime where Eros and Thanatos meet. As symbolisms of mystical and erotic experiences fuse and confuse each other, we are able to establish connections between Sufi, Hindi, and Judeo-Christian mystical poetry. Critical approach designations: Genres, Histories. Distribution requirement: Pre-1750.

LIT 188I - La novela picaresca (5)

Speaking, reading, and writing proficiency in Spanish required. The picaresque novel of 16th-century Spain considers the fictive environment as reality in order to introduce its protagonist as a rebel against social dominion. The picaresque novel is the only literary genre comparable to what is now called literature of social protest. Critical approach designations: Genres, Histories. Distribution requirement: Pre-1750.

LIT 188L - Literatura de la guerra civil española (5)

Speaking, reading, and writing proficiency in Spanish required. Examines literature related to the period of the Spanish Civil War (1936-39) and the Franco years (1939-75). Includes works by Spanish writers in exile during this period; also examines literary texts written prior to the outbreak of the war. Critical approach designations: Histories, Power and Subjectivities.

LIT 188M - Literatura peninsular: siglos XIX y XX (5)

Speaking, reading, and writing proficiency in Spanish required. A critical study of several representative texts from this period of Spanish literature. Critical approach designations: Geographies, Histories.

LIT 188R - Humanidades Ambientales (5)

Considers salient aspects of environmental aesthetics and ecological thinking in Latin America in a variety of genres including memoir, children's literature, graphic literature, documentary film, and visual arts. Critical approach designations: Media, Power and Subjectivities. Distribution requirement: Global.

LIT 188Z - Literatura de España (5)

Speaking, reading, and writing proficiency in Spanish required. Examines works by Spanish authors with attention to historical and cultural as well as literary issues. Course topic changes, see the Class Search for current topic. Critical approach designations: Geographies, Histories.

LIT 189A - De la conquista a Sor Juana (5)

Speaking, reading, and writing proficiency in Spanish required. A study of Hispanic American and Peninsular literatures from the chronicles of the conquest through the 17th century. Readings deal with transformations in both the idea of empire and the rights of the conquered. Includes the works of Colon, Cortes, El Inca Garcilaso de la Vega, Sor Juana Ines de la Cruz, and others. Critical approach designations: Canons, Histories. Distribution requirements: Global, Pre-1750.

LIT 189B - El Siglo XIX en America Latina: cultura, política y sociedad (5)

Speaking, reading, and writing proficiency in Spanish required. Follows the literary manifestations of the growing consciousness of the Latin American writer: discovery of native themes, comparative analysis of Spanish American and Peninsular European models, search for a new language literally and figuratively. Relates historical events with literary movements. Critical approach designations: Geographies, Histories. Distribution requirement: Global.

LIT 189C - Introducción a Spanish Studies (5)

Speaking, reading, and writing proficiency in Spanish is required. Explores the social, cultural, economic, and political changes that connect Latin America, Spain, and the United States Latina/o communities. Critical approach designations: Geographies, Power and Subjectivities. Distribution requirement: Global.

Prerequisite: Prerequisite(s): SPAN 6 or SPHS 6 or permission of instructor.

LIT 189D - Sor Juana Ines de la Cruz (5)

Speaking, reading, and writing proficiency in Spanish required. An in-depth examination of the life and work of Sor Juana Ines de la Cruz, a 17th-century nun, poet, playwright, and woman of genius and intellectual prowess whose ideas and

accomplishments were ahead of her time. Critical approach designations: Canons, Histories. Distribution requirement: Pre-1750.

LIT 189E - Cuba (5)

Speaking, reading, and writing proficiency in Spanish required. Examines Cuban literature and culture, with attention to historical context. Course topic changes: please see the Class Search for current topic. Critical approach designations: Geographies, Histories. Distribution requirement: Global.

LIT 189F - Literaturas Latinas en los Estados Unidos: en inglés, español y Spanglish (5)

Speaking, reading, and writing proficiency in Spanish required. Spanish-based, English/bilingual inclusive overview of Latino/a writing in the U.S. Critical approach designations: Genres, Geographies. Distribution requirement: Global.

LIT 189G - Cine y Literatura (5)

Speaking, reading, and writing proficiency in Spanish required. Analysis and interpretation of Spanish-language films derived from literary works by Latin American and Spanish authors. Topic changes; see the Class Search for current topic. Critical approach designations: Genres, Media. Distribution requirement: Global.

LIT 189H - La Globalización en/del Cine Latin/o Americano (5)

Speaking, reading, and writing proficiency in Spanish required. Examines globalization of Latin/o American cinema as a cultural industry. Classical issues of cultural politics and political economy are revisited from the viewpoint of current global processes. Also provides access to the representation of different aspects of globalization in Latin/o American cinema. Critical approach designations: Media, Power and Subjectivities. Distribution requirement: Global.

LIT 189I - Literatura e indigeneidad (5)

Speaking, reading, and writing proficiency in Spanish required. Course examines the history, representation, and politics of Indigeneity and Indigenous literature in Latin America by analyzing novels, short stories, transcribed oral tradition, film, and radio. Critical approach designations: Geographies, Power and Subjectivities. Distribution requirement: Global.

LIT 189K - El ensayo latinoamericano (5)

Speaking, reading, and writing proficiency in Spanish required. A study of the essay in Spanish America from Sarmiento to the present, concentrating on problems of national or cultural identity. Critical approach designations: Geographies, Histories. Distribution requirement: Global.

LIT 189L - Poesía latinoamericana (5)

Speaking, reading, and writing proficiency in Spanish required. Poets from modernismo to the present in Spanish America. Studies how this poetry attempts to define Latin America, its past, its present history, and its vision for the future. Critical approach designations: Genres, Geographies. Distribution requirements: Global, Poetry.

LIT 189M - Prosa contemporánea hispanoamericana (5)

Speaking, reading, and writing proficiency in Spanish required. Examines contemporary Spanish American prose. Course topic changes; please see the Class Search for current topic. Critical approach designations: Genres, Geographies. Distribution requirement: Global.

LIT 189N - Latinoamericano testimonio (5)

Speaking, reading, and writing proficiency in Spanish required. Contemporary non-fiction testimonial literature of Latin America. Critical approach designations: Genres, Power and Subjectivities. Distribution requirement: Global.

LIT 189O - El Cuento Hispanoamericano: Variedades estéticas de la literatura breve en América Latina (5)

Speaking, reading, and writing proficiency in Spanish required. Explores various aesthetics of the Latin American short story including fantastic, detective, metaliterary, social critique, historical, and philosophical writings. Critical approach designations: Canons, Genres. Distribution requirement: Global.

LIT 189P - Las mujeres en la literatura latinoamericana (5)

Speaking, reading, and writing proficiency in Spanish required. Literary and sociological writings by and about women in Latin America-in Hispanic, indigenous, and African-Latino communities; in rural and urban settings; in historical and contemporary periods. Critical approach designations: Geographies, Power and Subjectivities. Distribution requirement: Global.

LIT 189Q - Ficción y marginalidad (5)

Speaking, reading, and writing proficiency in Spanish required. Marginalized perspectives take center stage in this course that studies ways Latin American/Latino authors textually contest dominant representations and realities, opening symbolic spaces for emergent historical subjects who gain agency and authority by re/presenting unmapped terrains. Texts include chronicles, testimonios, writings of the self, and novels. Critical approach designations: Geographies, Power and Subjectivities. Distribution requirement: Global.

LIT 189R - La Novela de la Dictadura (5)

Speaking, reading, and writing proficiency in Spanish required. An analysis of novels which focus on the theme of dictators and the rhetoric of dictatorships in Latin America. Texts are studied as literary manifestations of particular historical and political periods. Critical approach designations: Genres, Power and Subjectivities. Distribution requirement: Global.

LIT 189S - La cultura popular en la narrativa latinoamericana (5)

Speaking, reading, and writing proficiency in Spanish required. Explores short stories and novels that have been greatly influenced by popular culture, not only in theme, but also by appropriation of popular forms of language and modes of representation. Includes works by authors from Mexico, Argentina, Cuba, and Colombia. Critical approach designations: Genres, Geographies. Distribution requirement: Global.

LIT 189T - Historia de la lectura y los lectores: Recepcion y consumo cultural en el mundo Latino Americano (5)

Speaking, reading, and writing proficiency in Spanish required. Explores historical readers and reading practices in at least three different formations: colonial, national-popular, and transnational. Proposes a historical-theoretical reconstruction of the place of reading and readers at key moments in the history of culture in Latin America. Critical approach designations: Histories, Power and Subjectivities. Distribution requirement: Global.

LIT 189U - Modernidad y literatura: El Boom de la novela latinoamericana (5)

Speaking, reading, and writing proficiency in Spanish required. Explores the relationships between literature and mass culture, modernization, and globalization through the study of the so-called Boom of Latin American narrative. Critical approach designations: Genres, Histories. Distribution requirement: Global.

LIT 189V - Andean Indigenismo (5)

An introduction to the indigenista movement in Peru, Bolivia, Ecuador, and Paraguay, and to the literary and ideological debates surrounding it. Authors include Mariategui, Gonzalez Prada, Arguedas, Icaza, Alegria, and Vallejo. Critical approach designations: Geographies, Power and Subjectivities. Distribution requirement: Global.

LIT 189X - Estudios mediaticos (5)

Investigates film, radio, video games, new media, and other newly emergent forms of cultural production in the Spanish-speaking world. Topics may include the historical study of media, media-focused analysis of literary texts, and new media translation. The course topic changes; see the Class Search for the current topic. Critical approach designations: Genres, Media.

LIT 189Z - Literatura de Chile (5)

Speaking, reading, and writing proficiency in Spanish required. Focusing on narrative and poetry in Chile and their transformations during the 20th century, course examines the relationships between literature, nation, and representation. Critical approach designations: Canons, Histories. Distribution requirement: Global.

LIT 190A - Topics in Pre- and Early Modern Studies (5)

Examination of individual authors or critical problems in ancient, medieval, or early modern/Renaissance literature. Course topic changes; see the Class Search for current topic. Critical approach designations: Canons, Histories. Distribution requirements: Pre-1750, Senior Seminar.

Prerequisite: Prerequisite(s): LIT 101. Enrollment is restricted to senior literature majors.

LIT 190F - Studies in Poetry (5)

Studies in English-language poetry. Course topic changes; see the Class Search for current topic. Critical approach

designations: Genres, Histories. Distribution requirements: Poetry, Senior Seminar.

Prerequisite: Prerequisite(s): LIT 101. Enrollment is restricted to senior literature majors.

LIT 190I - Individual Authors (5)

Intensive examination of works by individual authors. Course topic changes; see the Class Search for current topic. Critical approach designations: Genres, Histories. Distribution requirement: Senior Seminar.

Prerequisite: Prerequisite(s): LIT 101. Enrollment is restricted to senior literature majors.

LIT 190J - Studies in English Language Literature (5)

Studies of selected authors or issues in English language literature. Course topic changes; see the Class Search for current topic. Critical approach designations: Geographies, Histories. Distribution requirement: Senior Seminar.

Prerequisite: Prerequisite(s): LIT 101. Enrollment is restricted to senior Literature majors.

LIT 190K - Studies in U.S. Literature (5)

Intensive examination of issues in U.S. literature. Course topic changes; see the Class Search for current topic. Critical approach designations: Geographies, Histories. Distribution requirement: Senior Seminar.

Prerequisite: Prerequisite(s): LIT 101. Enrollment is restricted to senior literature majors.

LIT 190L - Topics in World Literature and Cultural Studies (5)

Course topic changes; see the Class Search for current topic. Critical approach designations: Histories, Power and Subjectivities. Distribution requirements: Global, Senior Seminar.

Prerequisite: Prerequisite(s): LIT 101. Enrollment is restricted to senior literature majors.

LIT 190N - Studies in 19th-Century British Literature (5)

Study of selected authors or issues in 19th-century British literature. Course topic changes; see the Class Search for current topic. Critical approach designations: Geographies, Histories. Distribution requirement: Senior Seminar.

Prerequisite: Prerequisite(s): LIT 101. Enrollment is restricted to senior literature majors.

LIT 190O - Studies in Slavery, Race, and Nation in the Americas (5)

Compares literatures and histories of slavery, abolitionism, and nationalism in 19th-century Cuba and the U.S. Readings include slave narratives and antislavery novels. Critical approach designations: Histories, Power and Subjectivities. Distribution requirements: Global, Senior Seminar.

Prerequisite: Prerequisite(s): LIT 101. Enrollment is restricted to senior literature majors.

LIT 190T - Topics in Modern Literary Studies (5)

Selected authors or issues in modern literary and cultural studies. Course topic changes; see the Class Search for current topic. Critical approach designation: Histories. Distribution requirement: Senior Seminar.

Prerequisite: Prerequisite(s): LIT 101. Enrollment is restricted to senior literature majors.

LIT 190U - Topics in Theory (5)

Advanced work in theory (e.g., cultural, ideological, literary, social). Course topic changes; see the Class Search for the current topic. Critical approach designations: Canons, Histories. Distribution requirement: Senior Seminar.

Prerequisite: Prerequisite(s): LIT 101. Enrollment is restricted to senior literature majors and minors.

LIT 190V - Fiction Senior Seminar (5)

Satisfies the Creative Writing Literature concentration; also satisfies the senior seminar distribution requirement. Critical approach designation: Media. Distribution requirement: Senior Seminar.

Prerequisite: Prerequisite(s): LIT 101. Enrollment is restricted to senior creative writing literature majors.

LIT 190W - Poetry Senior Seminar (5)

Satisfies the Creative Writing Literature concentration; also satisfies the senior seminar distribution requirement. Critical approach designation: Media. Distribution requirement: Senior Seminar.

Prerequisite: Prerequisite(s): LIT 101. Enrollment is restricted to senior creative writing literature majors.

LIT 190X - Temas de la literatura y cultura espanolas y latinoamericanas (5)

Speaking, reading, and writing proficiency in Spanish is required. Examines authors or issues in Spanish and Latin American literature and cultures. Course topic changes; see the Class Search for the current topic. Critical approach designations: Geographies, Histories. Distribution requirement: Senior Seminar. Spanish studies majors may use this course to satisfy the Spanish studies senior exit requirement.

Prerequisite: Prerequisite(s): LIT 101. Enrollment is restricted to senior literature majors.

LIT 190Y - Topics in Jewish Literature and Culture (5)

Study of selected authors or issues related to modern Jewish literature and culture. Topic changes; please see the Class Search for current topic. Critical approach designations: Histories, Power and Subjectivities. Distribution requirement: Senior Seminar. Jewish Studies majors may use this course to satisfy the Jewish Studies senior exit requirement.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, and LIT 101 (for

literature majors). Enrollment is restricted to senior literature and Jewish studies majors.

LIT 190Z - Topics in German Literature and Culture (5)

Study of selected authors or issues related to German literature and culture. Course topic changes; please see the Class Search for current topic. Critical approach designations: Geographies, Histories. Distribution requirement: Senior Seminar. German studies majors may use this course to satisfy the German studies senior exit requirement.

Prerequisite: Prerequisite(s): LIT 101 and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior German studies and literature majors.

LIT 191 - Methodologies of Teaching (3)

This three-credit course provides students with the theoretical and practical knowledge to help others become more careful, sensitive, and sophisticated readers of complex texts. Enrollment by permission of the instructor.

LIT 192 - Directed Student Teaching (5)

Teaching of a lower-division seminar under faculty supervision. (See LIT 42.)

LIT 195A - Senior Essay (5)

Study of literature in English or English translation. Satisfies the Literature major senior exit distribution requirement. Students submit petition to sponsoring agency. Prerequisite(s): LIT 101. Enrollment is restricted to seniors.

LIT 195B - Senior Essay (5)

Speaking, reading, and writing proficiency in French, German, Greek, Italian, Latin, Spanish, or other non-English language required. Satisfies the Literature major senior exit distribution requirement. Students submit petition to sponsoring agency. Prerequisite(s): LIT 101. Enrollment is restricted to seniors.

LIT 195C - Senior Essay (5)

Satisfies the Creative Writing senior exit distribution requirement. Prerequisite(s): LIT 101. Students submit petition to sponsoring agency. Enrollment restricted to senior creative writing literature majors.

LIT 198A - Group Tutorial (5)

Study of literature in English or English translation. Students submit petition to sponsoring agency.

LIT 198B - Group Tutorial (5)

Speaking, reading, and writing proficiency in French, German, Greek, Italian, Latin, Spanish or other non-English language required. Students submit petition to sponsoring agency.

LIT 198C - Group Tutorial (5)

Study of creative writing. Students submit petition to sponsoring agency.

LIT 199A - Tutorial (5)

Study of literature in English or English translation. Students submit petition to sponsoring agency.

LIT 199B - Tutorial (5)

Speaking, reading, and writing proficiency in French, German, Greek, Italian, Latin, Spanish or other non-English language required. Students submit petition to sponsoring agency.

LIT 199C - Tutorial (5)

Study of creative writing. Students submit petition to sponsoring agency.

LIT 199F - Tutorial (2)

Students submit petition to sponsoring agency.

Graduate**LIT 200 - Proseminar (5)**

The proseminar provides a common experience for entering students, facilitates exchange of ideas and approaches to literary and extra-literary texts, critical issues, and theoretical problems. It focuses on broad aspects of the history of theory and criticism, on the students' critical writing, and on aspects of professional development.

Prerequisite: Enrollment is restricted to graduate students.

LIT 201 - The Pedagogy of Literature (2)

Provides training for graduate students in university-level pedagogy in general and in the pedagogy of literature specifically. Coordinated by a graduate student who has had substantial experience as a teaching assistant, under the supervision of a faculty member.

Prerequisite: Enrollment is restricted to graduate students.

LIT 202 - Colloquium (2)

Student receives credit for attending a designated number of freestanding lectures, colloquia, symposia, or conferences during the term and reports orally, or in writing, to instructor. Enrollment restricted to graduate students.

LIT 204 - Readings in Literature (2)

Focuses on selected texts or authors in literature and/or theory. Students meet with instructor to discuss readings and deepen their knowledge on a particular author, critic, theorist, or text.

Prerequisite: Enrollment is restricted to graduate students.

LIT 205 - Writing and Publication Practicum (2)

Introduces the methods and practice of dissertation writing and publication in literature. Workshop format. Meets one hour per week.

Prerequisite: Enrollment is restricted to graduate students.

LIT 206 - Critical Writing Practicum (5)

Reinforces writing and revision skills in the discipline of literary and cultural criticism and theory, covering various genres of writing in the profession. Designed for students preparing for QE or dissertation work. Workshop structure.

Prerequisite: Enrollment is restricted to graduate students.

LIT 221 - Canons (5)

Considers literary canon formation through the lens of neglected or lost works by authors otherwise considered peripheral because of their language, cultural tradition, or regional affiliation.

Prerequisite: Enrollment restricted to graduate students.

LIT 222 - Topics in English Language Literature (5)

Course topic changes; see the Class Search for current topic.

Prerequisite: Enrollment is restricted to graduate students.

LIT 223 - Periods and Movements (5)

Examines a particular historical period or literary movement. Course topic changes; see the Class Search for current topic.

Prerequisite: Enrollment is restricted to graduate students.

LIT 224 - Transnational Literatures (5)

Investigation of English language literature which transcends national boundaries. Course topic changes; see the Class Search for current topic.

Prerequisite: Enrollment is restricted to graduate students.

LIT 230A - Topics in Theory (5)

Explores issues arising in both the modern practice of criticism and in writings on the theory of criticism. Course topic changes; please see the Class Search for current topic.

Prerequisite: Enrollment is restricted to graduate students.

LIT 230B - Narrative Theory (5)

A survey of 20th-century narratology, emphasizing structuralist and poststructuralist theories of narrative.

Prerequisite: Enrollment is restricted to graduate students.

LIT 230C - Feminist Theories/Historical Perspectives (5)

A critical examination of feminist and related theories (queer, critical race, post-humanist) and criticism in historical and culturally specific contexts.

Prerequisite: Enrollment is restricted to graduate students.

LIT 231A - Studies in Literary and Cultural History (5)

Course topic changes; see the Class Search for current topic.

Prerequisite: Enrollment is restricted to graduate students.

LIT 237A - Modernism (5)

Focuses on modernism and the intellectual and social forces which help illuminate that period. Considers concepts by which the innovative tendencies in 20th-century modernist literature and arts have been theorized and periodized, including high and late modernism, avant-garde and experimental, and the concept of global modernisms.

Prerequisite: Enrollment is restricted to graduate students.

LIT 240G - History and Tragedy (5)

Examines history, tragedy, and early science as ways of representing human experience in the Western canon. Topics include truth claims and questions of evidence, the nature of historical events, and tragedy as a political medium.

Prerequisite: Enrollment is restricted to graduate students.

LIT 243A - Studies in Early Modernity (5)

In-depth examination of a topic in Early Modern Studies. Course topic changes; see the Class Search for current topic.

Prerequisite: Enrollment is restricted to graduate students.

LIT 243B - Early Modern Colonial Encounters (5)

This course will examine primary texts and interpretations, both fictional and archival, of the encounter between western Europe and non-European populations affected by European expansion from the 15th through the 18th centuries.

Prerequisite: Enrollment is restricted to graduate students.

LIT 246 - Individual Authors (5)

Focuses on work of a single author in literary historical and/or historical context. Course topic changes; see the Class Search for current topic.

Prerequisite: Enrollment is restricted to graduate students.

LIT 250 - Theory and Methods (5)

Global theories of history and cultural production. Course topic changes; see the Class Search for current topic.

Prerequisite: Enrollment is restricted to graduate students.

LIT 251 - Topics in Cultural Studies (5)

The course topic changes; see the Class Search for the current topic.

Prerequisite: Enrollment is restricted to graduate students.

LIT 279A - Methods and Materials (5)

A combined seminar and creative-writing workshop with a concentrated focus on a particular problem, aspect, or genre of poetry or prose writing. Includes reading and analysis of selected texts with critical responses and creative writing. Explores the productive interaction between various practices of scholarship and creative invention. The course topic changes; please see the Class Search for the current topic.

Prerequisite: Enrollment is restricted to graduate students.

LIT 279B - Writing Studio (5)

In this graduate-level, multi-genre course, students develop their own creative projects of publishable quality under the guidance of the instructor.

Prerequisite: Enrollment is restricted to graduate students in the creative/critical concentration or by permission of the instructor.

LIT 282A - Studies in Literary Genres (5)

An in-depth examination of one genre of French literature. Course topic changes; see the Class Search for current topic.

Prerequisite: Enrollment is restricted to graduate students.

LIT 282B - Studies in Literary and Cultural History (5)

In-depth examination of one period of French literature. Course topic changes; see the Class Search for current topic.

Prerequisite: Enrollment is restricted to graduate students.

LIT 282C - Texts and Contexts (5)

The implications of social and political change examined in terms of literary theory and practice. Equal emphasis placed on literary and other kinds of cultural texts: historical, political, cinematic.

Prerequisite: Enrollment is restricted to graduate students.

LIT 282D - Topics in Theory (5)

Prerequisite: Enrollment is restricted to graduate students.

LIT 282F - French Literature Outside France (5)

A study of texts written in French-speaking cultures: Belgium, Canada, Africa, the Caribbean.

Prerequisite: Enrollment is restricted to graduate students.

LIT 283A - Deutsche Literatur und Kultur (5)

Examination of topics within German literature. Course topic changes; see the Class Search for the current topic.

Prerequisite: Enrollment is restricted to graduate students.

LIT 285H - Studies in Italian Literature and Culture (5)

Reading proficiency in Italian is required. Close examination of a topic in Italian literature and culture. Course topic changes; see the Class Search for current topic.

Prerequisite: Enrollment is restricted to graduate students.

LIT 288C - Don Quijote (5)

Concentrates on the study and analysis of Miguel de Cervantes' major work *Don Quijote*, with a three-part structure: life and literature in *Don Quijote*; Cervantes-the father of the modern novel; and madness and ingenio in *Don Quijote*.

Prerequisite: Enrollment is restricted to graduate students.

LIT 288F - Writing and Re-Writing of the Conquest and Colonial Period in Spanish America (5)

Study of 1) the writings (chronicles, memoirs, diaries, letters) comprising European and indigenous accounts of the encounter and indigenous, criolla, and mestiza writings during the colony; and 2) the re-writings of these events in contemporary post-colonial novels.

Prerequisite: Enrollment is restricted to graduate students.

LIT 288M - Cuba (5)

Course topic changes; please see the Class Search for the current topic.

Prerequisite: Enrollment is restricted to graduate students.

LIT 288O - The Conquest through the Eyes of Contemporary Writers (5)

Analyzes contemporary writers who fictionalize the phenomenon of the conquest of the Americas. These authors, who combine chronicles, biographies, and accounts with fiction, offer an imaginative way to view history.

LIT 288P - The Avant Garde in Latin America (5)

Emerging from a Europe in crisis, this 20th-century avant-garde movement opened a space in Latin/o American literature for the emergence of a post-western aesthetic exploring a cultural identity in difference. A deconstruction of vanguardismo, lo real maravilloso, lo fantástico, lo mítico-antropológico, and realismo mágico.

Prerequisite: Enrollment is restricted to graduate students.

LIT 288S - Citiscapes (5)

Theories of space/place poetics and politics, and the literary and visual re-presentations of urban spaces in Latin/o America. Questions of identity and location in modernist poetics, and the ways difference (gender, ethnicity, and sexuality) inhabit and imagine the post-modern lettered city.

Prerequisite: Enrollment is restricted to graduate students.

LIT 288U - Spain in the Eyes/Camera of Pedro Almodovar (5)

Contemporary Spain through the camera of Pedro Almodovar from transgressive enthusiasm, experimentation, and cultural disobedience of the 1980s to more universal themes of human nature and borderline experiences in the pursuit of love, relationships, beauty, and art.

Prerequisite: Enrollment is restricted to graduate students.

LIT 288W - Becoming European (5)

Course considers the process of globalization as it has affected Spain in the last ten years. Through the study of a variety of cultural texts, it explores the challenges presented to national identity and the emergence of new subjectivities and collective identities.

Prerequisite: Enrollment is restricted to graduate students.

LIT 288Y - Teoria Critica en America Latina (5)

Overview of contemporary theoretical issues in Latin American cultural critique. Course topic changes; please see the Class Search for the current topic.

Prerequisite: Enrollment is restricted to graduate students.

LIT 288Z - Literatura y sociedad (5)

Analyzes the relationship between Latin American cultural products and their cultural, economic, and political contexts. The course topic changes; please see the Class Search for the current topic.

Prerequisite: Enrollment is restricted to graduate students.

LIT 291F - Advising (2)

Independent study formalizing the advisee-adviser relationship. Regular meetings to plan, assess, and monitor academic progress and to evaluate coursework as necessary. May be used to develop general bibliography of background reading and trajectory of study. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

LIT 293 - Independent Study: Creative Writing (5)

Individual study with a professor in the creative/critical concentration. Written work is required. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

LIT 294 - Teaching-Related Independent Study (5)

Directed graduate research and writing coordinated with teaching of undergraduates. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

LIT 295A - Directed Reading (5)

Study of literature in English or English translation. Directed reading that does not involve a term paper. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

LIT 295B - Directed Reading (5)

Speaking, reading, and writing proficiency in French, German, Greek, Italian, Latin, Spanish, or other non-English language required. Directed reading which does not involve a term paper. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

LIT 295C - Directed Reading (5)

Study of creative writing. Directed reading that does not involve a term paper. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

LIT 296A - Special Student Seminar (5)

Study of literature in English or English translation. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

LIT 296B - Special Student Seminar (5)

Speaking, reading, and writing proficiency in French, German, Greek, Italian, Latin, Spanish, or other non-English language required. Directed reading which does not involve a term paper. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

LIT 296C - Special Student Seminar (5)

Study of creative writing. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

LIT 297A - Independent Study (5)**LIT 297B - Independent Study (10)**

Speaking, reading, and writing proficiency in French, German, Greek, Italian, Latin, Spanish, or other non-English language required. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

LIT 297F - Independent Study (2)

Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

LIT 299A - Thesis Research (5)

Thesis Research

LIT 299B - Thesis Research (10)

Thesis Research

MATH - MATHEMATICS**Lower-Division****MATH 2 - College Algebra for Calculus (5)**

Operations on real numbers, complex numbers, polynomials, and rational expressions; exponents and radicals; solving linear and quadratic equations and inequalities; functions, algebra of functions, graphs; conic sections; mathematical models; sequences and series.

Prerequisite: Prerequisite(s): mathematics placement (MP) score of 100 or higher. Students may not enroll in or receive credit for MATH 2 after receiving credit with a 'C' or better in AM 3, MATH 3, AM 11A, MATH 11A, MATH 19A, MATH 20A or equivalents.

MATH 2S - College Algebra for Calculus (2)

This two-credit, stretch course offers students two quarters to master material covered in MATH 2: operations on real numbers, complex numbers, polynomials, and rational expressions; exponents and radicals; solving linear and quadratic equations and inequalities; functions, algebra of functions, graphs; conic sections; mathematical models; sequences and series. After successful completion of this course in the first quarter, students enroll in MATH 2 the following quarter to complete the sequence and earn an additional 5 credits.

Prerequisite: Prerequisite(s): mathematics placement (MP) score of 100 or higher.

MATH 2T - Preparatory Math: Tutorial (2)

Independent study of algebra and modern mathematics using adaptive learning software. Instruction emphasizes clear mathematical communication and reasoning when working with sets, equations, functions, and graphs. Drop in labs, online forums, and readings provide opportunities for further learning and exploration.

Prerequisite: Prerequisite(s): mathematics placement (MP) score of 100 or higher.

MATH 3 - Precalculus (5)

Inverse functions and graphs; exponential and logarithmic functions, their graphs, and use in mathematical models of the real world; rates of change; trigonometry, trigonometric functions, and their graphs; and geometric series. Students cannot receive credit for both MATH 3 and AM 3.

Prerequisite: Prerequisite(s): MATH 2 or mathematics placement (MP) score of 200 or higher. Students may not enroll in or receive credit for MATH 3 after receiving credit with a 'C' or better in AM 11A, MATH 11A, MATH 19A, MATH 20A or equivalents.

MATH 4 - Mathematics of Choice and Argument (5)

Techniques of analyzing and creating quantitative arguments. Application of probability theory to questions in justice, medicine, and economics. Analysis and avoidance of statistical bias. Understanding the application and limitations of quantitative techniques.

Prerequisite: Prerequisite(s): MATH 2, or mathematics placement (MP) score of 200 or higher, or AP Calculus AB examination score of 3 or higher.

MATH 11A - Calculus with Applications (5)

A modern course stressing conceptual understanding, relevance, and problem solving. The derivative of polynomial, exponential, and trigonometric functions of a single variable is developed and applied to a wide range of problems involving graphing, approximation, and optimization. Students cannot receive credit for both this course and MATH 19A, or AM 11A, or AM 15A, or ECON 11A.

Prerequisite: Prerequisite(s): MATH 3 or AM 3; or mathematics placement (MP) score of 300 or higher; or AP Calculus AB exam score of 3 or higher.

MATH 11B - Calculus with Applications (5)

Starting with the fundamental theorem of calculus and related techniques, the integral of functions of a single variable is developed and applied to problems in geometry, probability, physics, and differential equations. Polynomial approximations, Taylor series, and their applications conclude the course. Students cannot receive credit for this course and MATH 19B, or AM 11B, or AM 15B, or ECON 11B.

Prerequisite: Prerequisite(s): MATH 11A or MATH 19A or AM 15A or AP Calculus AB exam score of 4 or 5, or BC exam score of 3 or higher, or IB Mathematics Higher Level exam score of 5 or higher.

MATH 19A - Calculus for Science, Engineering, and Mathematics (5)

The limit of a function, calculating limits, continuity, tangents, velocities, and other instantaneous rates of change. Derivatives, the chain rule, implicit differentiation, higher derivatives. Exponential functions, inverse functions, and their derivatives. The mean value theorem, monotonic functions, concavity, and points of inflection. Applied maximum and minimum problems. Students cannot receive credit for both this course and MATH 11A, or AM 11A, or AM 15A, or ECON 11A.

Prerequisite: Prerequisite(s): MATH 3; or mathematics placement (MP) score of 400 or higher; or AP Calculus AB exam score of 3 or higher.

MATH 19B - Calculus for Science, Engineering, and Mathematics (5)

The definite integral and the fundamental theorem of calculus. Areas, volumes. Integration by parts, trigonometric substitution, and partial fractions methods. Improper integrals. Sequences, series, absolute convergence and convergence tests. Power series, Taylor and Maclaurin series. Students cannot receive credit for both this course and MATH 11B, or AM 11B, or AM 15B, or ECON 11B.

Prerequisite: Prerequisite(s): MATH 19A or MATH 20A or AP Calculus AB exam score of 4 or 5, or BC exam score of 3 or higher, or IB Mathematics Higher Level exam score of 5 or higher.

MATH 20A - Honors Calculus (5)

Methods of proof, number systems, binomial and geometric sums. Sequences, limits, continuity, and the definite integral. The derivatives of the elementary functions, the fundamental theorem of calculus, and the main theorems of differential calculus.

Prerequisite: Prerequisite(s): mathematics placement (MP) score of 500 higher; or AP Calculus AB examination score of 4 or 5; or BC examination of 3 or higher; or IB Mathematics Higher Level examination score of 5 or higher.

MATH 20B - Honors Calculus (5)

Orbital mechanics, techniques of integration, and separable differential equations. Taylor expansions and error estimates, the Gaussian integral, Gamma function and Stirling's formula. Series and power series, numerous applications to physics.

Prerequisite: Prerequisite(s): MATH 20A.

MATH 21 - Linear Algebra (5)

Systems of linear equations matrices, determinants. Introduces abstract vector spaces, linear transformation, inner products, the geometry of Euclidean space, and eigenvalues. Students cannot receive credit for this course and AM 10.

Prerequisite: Prerequisite(s): MATH 11A or MATH 19A or MATH 20A or AM 11A or AM 15A.

MATH 22 - Introduction to Calculus of Several Variables (5)

Functions of several variables. Continuity and partial derivatives. The chain rule, gradient and directional derivative. Maxima and minima, including Lagrange multipliers. The double and triple integral and change of variables. Surface area and volumes. Applications from biology, chemistry, earth sciences, engineering, and physics. Students cannot receive credit for this course and MATH 23A.

Prerequisite: Prerequisite(s): MATH 11B or MATH 19B or MATH 20B or AM 15B or AP calculus BC exam score of 4 or 5.

MATH 23A - Vector Calculus (5)

Vectors in n-dimensional Euclidean space. The inner and cross products. The derivative of functions from n-dimensional to m-dimensional Euclidean space is studied as a linear transformation having matrix representation. Paths in 3-dimensions, arc length, vector differential calculus, Taylor's theorem in several variables, extrema of real-valued functions, constrained extrema and Lagrange multipliers, the implicit function theorem, some applications. Students cannot receive credit for this course and MATH 22 or AM 30.

Prerequisite: Prerequisite(s): MATH 19B or MATH 20B or AP calculus BC exam score of 4 or 5.

MATH 23B - Vector Calculus (5)

Double integral, changing the order of integration. Triple integrals, maps of the plane, change of variables theorem, improper double integrals. Path integrals, line integrals, parametrized surfaces, area of a surface, surface integrals. Green's theorem, Stokes' theorem, conservative fields, Gauss' theorem. Applications to physics and differential equations, differential forms.

Prerequisite: Prerequisite(s): MATH 23A.

MATH 24 - Ordinary Differential Equations (5)

First and second order ordinary differential equations, with emphasis on the linear case. Methods of integrating factors, undetermined coefficients, variation of parameters, power series, numerical computation. Students cannot receive credit for this course and AM 20.

Prerequisite: Prerequisite(s): MATH 22 or MATH 23A; MATH 21 is recommended as preparation.

MATH 99 - Tutorial (5)

MATH 99F - Tutorial (2)

Upper-Division

MATH 100 - Introduction to Proof and Problem Solving (5)

Students learn the basic concepts and ideas necessary for upper-division mathematics and techniques of mathematical proof. Introduction to sets, relations, elementary mathematical logic,

proof by contradiction, mathematical induction, and counting arguments.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; MATH 11A or MATH 19A or MATH 20A; and MATH 21 or AM 10 or AMS 10A.

MATH 101 - Mathematical Problem Solving (5)

Students learn the strategies, tactics, skills and tools that mathematicians use when faced with a novel (new) problem. These include generalization, specialization, the optimization, invariance, symmetry, Dirichlet's box principle among others in the context of solving problems from number theory, geometry, calculus, combinatorics, probability, algebra, analysis, and graph theory.

Prerequisite: Prerequisite(s): MATH 21 and MATH 100.

MATH 103A - Complex Analysis (5)

Complex numbers, analytic and harmonic functions, complex integration, the Cauchy integral formula, Laurent series, singularities and residues, conformal mappings.

Prerequisite: Prerequisite(s): MATH 23B; and either MATH 100 or CSE 101.

MATH 103B - Complex Analysis II (2)

Conformal mappings, the Riemann mapping theorem, Mobius transformations, Fourier series, Fourier and Laplace transforms, applications, and other topics as time permits.

Prerequisite: Prerequisite(s): MATH 103A.

MATH 105A - Real Analysis (5)

The basic concepts of one-variable calculus are treated rigorously. Set theory, the real number system, numerical sequences and series, continuity, differentiation.

Prerequisite: Prerequisite(s): MATH 22 or MATH 23B and either MATH 100 or CSE 101.

MATH 105B - Real Analysis (5)

Metric spaces, differentiation and integration of functions. The Riemann-Stieltjes integral. Sequences and series of functions.

Prerequisite: Prerequisite(s): MATH 105A.

MATH 105C - Real Analysis (5)

The Stone-Weierstrass theorem, Fourier series, differentiation and integration of functions of several variables.

Prerequisite: Prerequisite(s): MATH 105B.

MATH 106 - Systems of Ordinary Differential Equations (5)

Linear systems, exponentials of operators, existence and uniqueness, stability of equilibria, periodic attractors, and applications.

Prerequisite: Prerequisite(s): MATH 21 or AM 10; and either MATH 24 or AM 20; and either MATH 100 or CSE 101.

MATH 107 - Partial Differential Equations (5)

Topics covered include first and second order linear partial differential equations, the heat equation, the wave equation, Laplace's equation, separation of variables, eigenvalue problems, Green's functions, Fourier series, special functions including Bessel and Legendre functions, distributions and transforms.

Prerequisite: Prerequisite(s): MATH 21 or AM 10; and MATH 24 or AM 20; and either MATH 100 or CSE 101; MATH 106 is recommended as preparation.

MATH 110 - Introduction to Number Theory (5)

Prime numbers, unique factorization, congruences with applications (e.g., to magic squares). Rational and irrational numbers. Continued fractions. Introduction to Diophantine equations. An introduction to some of the ideas and outstanding problems of modern mathematics.

Prerequisite: Prerequisite(s): MATH 100 or CSE 101.

MATH 111A - Algebra (5)

Group theory including the Sylow theorem, the structure of abelian groups, and permutation groups. Students cannot receive credit for this course and MATH 111T.

Prerequisite: Prerequisite(s): MATH 21 or AM 10 and either MATH 100 or CSE 101.

MATH 111B - Algebra (5)

Introduction to rings and fields including polynomial rings, factorization, the classical geometric constructions, and Galois theory.

Prerequisite: Prerequisite(s): MATH 111A.

MATH 111T - Algebra (5)

Introduction to groups, rings and fields; integers and polynomial rings; divisibility and factorization; homomorphisms and quotients; roots and permutation groups; and plane symmetry groups. Also includes an introduction to algebraic numbers, constructible numbers, and Galois theory. Focuses on topics most relevant to future K-12 teachers. Students cannot receive credit for this course and MATH 111A.

Prerequisite: Prerequisite(s): MATH 100.

MATH 114 - Introduction to Financial Mathematics (5)

Financial derivatives: contracts and options. Hedging and risk management. Arbitrage, interest rate, and discounted value. Geometric random walk and Brownian motion as models of risky assets. Ito's formula. Initial boundary value problems for the heat and related partial differential equations. Self-financing replicating portfolio; Black-Scholes pricing of European options. Dividends. Implied volatility. American options as free boundary problems.

Prerequisite: Corequisite(s): STAT 131 or CSE 107.

MATH 115 - Graph Theory (5)

Graph theory, trees, vertex and edge colorings, Hamilton cycles, Eulerian circuits, decompositions into isomorphic subgraphs, extremal problems, cages, Ramsey theory, Cayley's spanning tree formula, planar graphs, Euler's formula, crossing numbers, thickness, splitting numbers, magic graphs, graceful trees, rotations, and genus of graphs.

Prerequisite: Prerequisite(s): MATH 21 or AM 10 and either MATH 100 or CSE 101.

MATH 116 - Combinatorics (5)

Based on induction and elementary counting techniques: counting subsets, partitions, and permutations; recurrence relations and generating functions; the principle of inclusion and exclusion; Polya enumeration; Ramsey theory or enumerative geometry.

Prerequisite: Prerequisite(s): MATH 100 or CSE 101. Enrollment is restricted to sophomores juniors, and seniors. Familiarity with basic group theory is recommended.

MATH 117 - Advanced Linear Algebra (5)

Review of abstract vector spaces. Dual spaces, bilinear forms, and the associated geometry. Normal forms of linear mappings. Introduction to tensor products and exterior algebras.

Prerequisite: Prerequisite(s): MATH 21 or AM 10 and either MATH 100 or CSE 101.

MATH 118 - Advanced Number Theory (5)

Topics include divisibility and congruences, arithmetical functions, quadratic residues and quadratic reciprocity, quadratic forms and representations of numbers as sums of squares, Diophantine approximation and transcendence theory, quadratic fields. Additional topics as time permits.

Prerequisite: Prerequisite(s): MATH 110 or MATH 111A.

MATH 120 - Coding Theory (5)

An introduction to mathematical theory of coding. Construction and properties of various codes, such as cyclic, quadratic residue, linear, Hamming, and Golay codes; weight enumerators; connections with modern algebra and combinatorics.

Prerequisite: Prerequisite(s): MATH 21.

MATH 121A - Differential Geometry (5)

Topics include Euclidean space, tangent vectors, directional derivatives, curves and differential forms in space, mappings. Curves, the Frenet formulas, covariant derivatives, frame fields, the structural equations. The classification of space curves up to rigid motions. Vector fields and differentiable forms on surfaces; the shape operator. Gaussian and mean curvature. The theorem Egregium; global classification of surfaces in three space by curvature.

Prerequisite: Prerequisite(s): MATH 21 and MATH 23B and either MATH 100 or CSE 101. MATH 105A strongly recommended.

MATH 121B - Differential Geometry and Topology (5)

Examples of surfaces of constant curvature, surfaces of revolutions, minimal surfaces. Abstract manifolds; integration theory; Riemannian manifolds. Total curvature and geodesics; the Euler characteristic, the Gauss-Bonnet theorem. Length-minimizing properties of geodesics, complete surfaces, curvature and conjugate points covering surfaces. Surfaces of constant curvature; the theorems of Bonnet and Hadamard.

Prerequisite: Prerequisite(s): MATH 121A.

MATH 124 - Introduction to Topology (5)

Topics include introduction to point set topology (topological spaces, continuous maps, connectedness, compactness), homotopy relation, definition and calculation of fundamental groups and homology groups, Euler characteristic, classification of orientable and nonorientable surfaces, degree of maps, and Lefschetz fixed-point theorem.

Prerequisite: Prerequisite(s): MATH 100; MATH 111A recommended.

MATH 128A - Classical Geometry: Euclidean and Non-Euclidean (5)

Euclidean, projective, spherical, and hyperbolic (non-Euclidean) geometries. Begins with the thirteen books of Euclid. Surveys the other geometries. Attention paid to constructions and visual intuition as well as logical foundations. Rigid motions and projective transformations covered.

Prerequisite: Prerequisite(s): either MATH 100 or CSE 101.

MATH 128B - Classical Geometry: Projective (5)

Theorems of Desargue, Pascal, and Pappus; projectivities; homogeneous and affine coordinates; conics; relation to perspective drawing and some history.

Prerequisite: Prerequisite(s): MATH 21.

MATH 129 - Algebraic Geometry (5)

Algebraic geometry of affine and projective curves, including conics and elliptic curves; Bezout's theorem; coordinate rings and Hilbert's Nullstellensatz; affine and projective varieties; and regular and singular varieties. Other topics, such as blow-ups and algebraic surfaces as time permits.

Prerequisite: Prerequisite(s): MATH 21 and MATH 100.

MATH 130 - Celestial Mechanics (5)

Solves the two-body (or Kepler) problem, then moves onto the N-body problem where there are many open problems. Includes central force laws; orbital elements; conservation of linear momentum, energy, and angular momentum; the Lagrange-Jacobi formula; Sundman's theorem for total collision; virial theorem; the three-body problem; Jacobi coordinates; solutions of Euler and of Lagrange; and restricted three-body problem.

Prerequisite: Prerequisite(s): MATH 19A and 19B; and MATH 23A or PHYS 5A or PHYS 6A; MATH 21 and MATH 24 strongly recommended.

MATH 134 - Cryptography (5)

Introduces different methods in cryptography (shift cipher, affine cipher, Vigenere cipher, Hill cipher, RSA cipher, ElGamal cipher, knapsack cipher). The necessary material from number theory and probability theory is developed in the course. Common methods to attack ciphers discussed.

Prerequisite: Prerequisite(s): MATH 100 or CSE 101; MATH 110 is recommended as preparation.

MATH 140 - Industrial Mathematics (5)

Introduction to mathematical modeling of industrial problems. Problems in air quality remediation, image capture and reproduction, and crystallization are modeled as ordinary and partial differential equations then analyzed using a combination of qualitative and quantitative methods.

Prerequisite: Prerequisite(s): MATH 24; and either MATH 100 or CSE 101; and MATH 105A.

MATH 145 - Introductory Chaos Theory (5)

The Lorenz and Rossler attractors, measures of chaos, attractor reconstruction, and applications from the sciences. Students cannot receive credit for this course and AM 114.

Prerequisite: Prerequisite(s): MATH 22 or MATH 23A; MATH 21; MATH 100 or CSE 101. Concurrent enrollment in MATH 145L is required.

MATH 145L - Introductory Chaos Laboratory (1)

Laboratory sequence illustrating topics covered in MATH 145. One three-hour session per week in microcomputer laboratory.

Prerequisite: Concurrent enrollment in MATH 145 is required.

MATH 148 - Numerical Analysis (5)

A survey of the basic numerical methods which are used to solve scientific problems, including mathematical analysis and computing assignments. Some prior experience with Matlab (or similar) is helpful but not required. Some typical topics are: computer arithmetic; Newton's method for non-linear equations; linear algebra; interpolation and approximation; numerical differentiation and integration; numerical solutions of systems of ordinary differential equations and some partial differential equations; convergence and error bounds. Students cannot receive credit for this course and AM 147.

Prerequisite: Prerequisite(s): MATH 22 or MATH 23A; and MATH 21 or AM 10; and MATH 24 or AM 20; and MATH 100 or CSE 101. Concurrent enrollment in MATH 148L is required.

MATH 148L - Numerical Analysis Laboratory (1)

Laboratory sequence illustrating topics covered in course 148. One three-hour session per week in the computer laboratory.

Prerequisite: Concurrent enrollment in MATH 148 is required.

MATH 152 - Programming for Mathematics (5)

Introduces programming in Python with applications to advanced mathematics. Students apply data structures and algorithms to topics such as numerical approximation, number theory, linear algebra, and combinatorics. No programming experience is necessary, but a strong mathematics background is required.

Prerequisite: Prerequisite(s): MATH 100.

MATH 160 - Mathematical Logic I (5)

Propositional and predicate calculus. Resolution, completeness, compactness, and Lowenheim-Skolem theorem. Recursive functions, Godel incompleteness theorem. Undecidable theories. Hilbert's 10th problem.

Prerequisite: Prerequisite(s): MATH 100 or CSE 101.

MATH 161 - Mathematical Logic II (5)

Naive set theory and its limitations (Russell's paradox); construction of numbers as sets; cardinal and ordinal numbers; cardinal and ordinal arithmetic; transfinite induction; axiom systems for set theory, with particular emphasis on the axiom of choice and the regularity axiom and their consequences (such as, the Banach-Tarski paradox); continuum hypothesis.

Prerequisite: Prerequisite(s): MATH 100 or equivalent, or by permission of instructor.

MATH 181 - History of Mathematics (5)

A survey from a historical point of view of various developments in mathematics. Specific topics and periods to vary yearly.

Prerequisite: Prerequisite(s): MATH 19B or MATH 20B. MATH 100 is strongly recommended for preparation.

MATH 192 - Dir Stu Teach (5)

MATH 194 - Senior Seminar (5)

Designed to expose the student to topics not normally covered in the standard courses. The format varies from year to year. In recent years each student has written a paper and presented a lecture on it to the class.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; MATH 103A or MATH 105A or MATH 110 or MATH 111A or MATH 111T or MATH 117. Enrollment priority is given to seniors; juniors may request permission from the undergraduate vice chair.

MATH 195 - Senior Thesis (5)

Students research a mathematical topic under the guidance of a faculty sponsor and write a senior thesis demonstrating knowledge of the material. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Students submit petition to sponsoring agency.

MATH 199 - Tutorial (5)

Students submit petition to sponsoring agency.

MATH 199F - Tutorial (2)

Tutorial

Graduate

MATH 200 - Algebra I (5)

Group theory: subgroups, cosets, normal subgroups, homomorphisms, isomorphisms, quotient groups, free groups, generators and relations, group actions on a set. Sylow theorems, semidirect products, simple groups, nilpotent groups, and solvable groups. Ring theory: Chinese remainder theorem, prime ideals, localization. Euclidean domains, PIDs, UFDs, polynomial rings. Prerequisite(s): MATH 111A and MATH 117 are recommended as preparation.

Prerequisite: Enrollment is restricted to graduate students.

MATH 201 - Algebra II (5)

Vector spaces, linear transformations, eigenvalues and eigenvectors, the Jordan canonical form, bilinear forms, quadratic forms, real symmetric forms and real symmetric matrices, orthogonal transformations and orthogonal matrices, Euclidean space, Hermitian forms and Hermitian matrices, Hermitian spaces, unitary transformations and unitary matrices, skewsymmetric forms, tensor products of vector spaces, tensor algebras, symmetric algebras, exterior algebras, Clifford algebras and spin groups.

Prerequisite: Prerequisite(s): MATH 200 is recommended as preparation. Enrollment is restricted to graduate students.

MATH 202 - Algebra III (5)

Module theory: Submodules, quotient modules, module homomorphisms, generators of modules, direct sums, free modules, torsion modules, modules over PIDs, and applications to rational and Jordan canonical forms. Field theory: field extensions, algebraic and transcendental extensions, splitting fields, algebraic closures, separable and normal extensions, the Galois theory, finite fields, Galois theory of polynomials.

Prerequisite: Prerequisite(s): MATH 201 is recommended as preparation. Enrollment is restricted to graduate students.

MATH 203 - Algebra IV (5)

Topics include tensor product of modules over rings, projective modules and injective modules, Jacobson radical, Wedderburn's theorem, category theory, Noetherian rings, Artinian rings, affine varieties, projective varieties, Hilbert's Nullstellensatz, prime spectrum, Zariski topology, discrete valuation rings, and Dedekind domains.

Prerequisite: Prerequisite(s): MATH 200, MATH 201, and MATH 202. Enrollment is restricted to graduate students.

MATH 204 - Analysis I (5)

Completeness and compactness for real line; sequences and infinite series of functions; Fourier series; calculus on Euclidean space and the implicit function theorem; metric spaces and the contracting mapping theorem; the Arzela-Ascoli

theorem; basics of general topological spaces; the Baire category theorem; Urysohn's lemma; and Tychonoff's theorem.

Prerequisite: Prerequisite(s): MATH 105A and MATH 105B are recommended as preparation. Enrollment is restricted to graduate students.

MATH 205 - Analysis II (5)

Lebesgue measure theory, abstract measure theory, measurable functions, integration, space of absolutely integrable functions, dominated convergence theorem, convergence in measure, Riesz representation theorem, product measure and Fubini's theorem. L^p spaces, derivative of a measure, the Radon-Nikodym theorem, and the fundamental theorem of calculus.

Prerequisite: Prerequisite(s): MATH 204. Enrollment is restricted to graduate students.

MATH 206 - Analysis III (5)

Banach spaces, Hahn-Banach theorem, uniform boundedness theorem, the open mapping and closed graph theorems, weak and weak* topology, the Banach-Alaoglu theorem, Hilbert spaces, self-adjoint operators, compact operators, spectral theory, Fredholm operators, spaces of distributions and the Fourier transform, and Sobolev spaces.

Prerequisite: Prerequisite(s): MATH 204 and MATH 205 recommended as preparation. Enrollment is restricted to graduate students.

MATH 207 - Complex Analysis (5)

Holomorphic and harmonic functions, Cauchy's integral theorem, the maximum principle and its consequences, conformal mapping, analytic continuation, the Riemann mapping theorem.

Prerequisite: Prerequisite(s): MATH 103 is recommended as preparation. Enrollment is restricted to graduate students.

MATH 208 - Manifolds I (5)

Definition of manifolds; the tangent bundle; the inverse function theorem and the implicit function theorem; transversality; Sard's theorem and the Whitney embedding theorem; vector fields, flows, and the Lie bracket; Frobenius's theorem. MATH 204 recommended for preparation.

Prerequisite: Enrollment is restricted to graduate students.

MATH 209 - Manifolds II (5)

Tensor algebra. Differential forms and associated formalism of pullback, wedge product, exterior derivative, Stokes theorem, integration. Cartan's formula for Lie derivative. Cohomology via differential forms. The Poincaré lemma and the Mayer-Vietoris sequence. Theorems of deRham and Hodge.

Prerequisite: Prerequisite(s): MATH 208. MATH 201 is recommended as preparation. Enrollment is restricted to graduate students.

MATH 210 - Manifolds III (5)

The fundamental group, covering space theory and van Kampen's theorem (with a discussion of free and amalgamated products of groups), CW complexes, higher homotopy groups, cellular and singular cohomology, the Eilenberg-Steenrod axioms, computational tools including Mayer-Vietoris, cup products, Poincaré duality, the Lefschetz fixed point theorem, the exact homotopy sequence of a fibration and the Hurewicz isomorphism theorem, and remarks on characteristic classes.

Prerequisite: Prerequisite(s): MATH 208 and MATH 209 recommended as preparation. Enrollment is restricted to graduate students.

MATH 211 - Algebraic Topology (5)

Continuation of MATH 210. Topics include theory of characteristic classes of vector bundles, cobordism theory, and homotopy theory.

Prerequisite: Prerequisite(s): MATH 200, MATH 201, and MATH 202 recommended as preparation. Enrollment is restricted to graduate students.

MATH 212 - Differential Geometry (5)

Principal bundles, associated bundles and vector bundles, connections and curvature on principal and vector bundles. More advanced topics include: introduction to cohomology, the Chern-Weil construction and characteristic classes, the Gauss-Bonnet theorem or Hodge theory, eigenvalue estimates for Beltrami Laplacian, and comparison theorems in Riemannian geometry.

Prerequisite: Prerequisite(s): MATH 208. Enrollment is restricted to graduate students.

MATH 213A - Partial Differential Equations I (5)

First of the two PDE courses covering basically Part I in Evans' book; *Partial Differential Equations*; which includes transport equations; Laplace equations; heat equations; wave equations; characteristics of nonlinear first-order PDE; Hamilton-Jacobi equations; conservation laws; some methods for solving equations in closed form; and the Cauchy-Kovalevskaya theorem.

Prerequisite: MATH 106 and MATH 107 are recommended as preparation. Enrollment is restricted to graduate students.

MATH 213B - Partial Differential Equations II (5)

Second course of the PDE series covering basically most of Part II in Evans' book and some topics in nonlinear PDE including Sobolev spaces, Sobolev inequalities, existence, regularity and a priori estimates of solutions to second order elliptic PDE, parabolic equations, hyperbolic equations and systems of conservation laws, and calculus of variations and its applications to PDE.

Prerequisite: Prerequisite(s): MATH 106, MATH 107, and MATH 213A are recommended as preparation. Enrollment is restricted to graduate students.

MATH 214 - Theory of Finite Groups (5)

Nilpotent groups, solvable groups, Hall subgroups, the Frattini subgroup, the Fitting subgroup, the Schur-Zassenhaus theorem, fusion in p -subgroups, the transfer map, Frobenius theorem on normal p -complements.

Prerequisite: Prerequisite(s): MATH 200 and MATH 201 recommended as preparation. Enrollment is restricted to graduate students.

MATH 215 - Operator Theory (5)

Operators on Banach spaces and Hilbert spaces. The spectral theorem. Compact and Fredholm operators. Other special classes of operators.

Prerequisite: Prerequisite(s): MATH 204, MATH 205, MATH 206, and MATH 207 are recommended as preparation. Enrollment is restricted to graduate students.

MATH 216 - Advanced Analysis (5)

Topics include: the Lebesgue set, the Marcinkiewicz interpolation theorem, singular integrals, the Calderon-Zygmund theorem, Hardy Littlewood-Sobolev theorem, pseudodifferential operators, compensated compactness, concentration compactness, and applications to PDE.

Prerequisite: Prerequisite(s): MATH 204, MATH 205, and MATH 206 recommended as preparation. Enrollment is restricted to graduate students.

MATH 217 - Advanced Elliptic Partial Differential Equations (5)

Topics include elliptic equations, existence of weak solutions, the Lax-Milgram theorem, interior and boundary regularity, maximum principles, the Harnack inequality, eigenvalues for symmetric and non-symmetric elliptic operators, calculus of variations (first variation: Euler-Lagrange equations, second variation: existence of minimizers). Other topics covered as time permits.

Prerequisite: Prerequisite(s): MATH 204, MATH 205, and MATH 206 recommended as preparation. Enrollment is restricted to graduate students.

MATH 218 - Advanced Parabolic and Hyperbolic Partial Differential Equations (5)

Topics include: linear evolution equations, second order parabolic equations, maximum principles, second order hyperbolic equations, propagation of singularities, hyperbolic systems of first order, semigroup theory, systems of conservation laws, Riemann problem, simple waves, rarefaction waves, shock waves, Riemann invariants, and entropy criteria. Other topics covered as time permits.

Prerequisite: Prerequisite(s): MATH 205 and MATH 206. Enrollment is restricted to graduate students.

MATH 219 - Nonlinear Functional Analysis (5)

Topological methods in nonlinear partial differential equations, including degree theory, bifurcation theory, and monotonicity.

Topics also include variational methods in the solution of nonlinear partial differential equations.

Prerequisite: Enrollment is restricted to graduate students.

MATH 220A - Representation Theory I (5)

Lie groups and Lie algebras, and their finite dimensional representations.

Prerequisite: Prerequisite(s): MATH 200, MATH 201, and MATH 202. MATH 225A and MATH 227 recommended as preparation. Enrollment is restricted to graduate students.

MATH 220B - Representation Theory II (5)

Lie groups and Lie algebras, and their finite dimensional representations.

Prerequisite: Prerequisite(s): MATH 220A. Enrollment is restricted to graduate students.

MATH 222A - Algebraic Number Theory (5)

Topics include algebraic integers, completions, different and discriminant, cyclotomic fields, parallelotopes, the ideal function, ideles and adèles, elementary properties of zeta functions and L-series, local class field theory, global class field theory. MATH 200, MATH 201, and MATH 202 are recommended as preparation.

Prerequisite: Enrollment is restricted to graduate students.

MATH 222B - Algebraic Number Theory (5)

Topics include geometric methods in number theory, finiteness theorems, analogues of Riemann-Roch for algebraic fields (after A. Weil), inverse Galois problem (Belyi theorem) and consequences.

Prerequisite: Enrollment is restricted to graduate students.

MATH 223A - Algebraic Geometry I (5)

Topics include examples of algebraic varieties, elements of commutative algebra, local properties of algebraic varieties, line bundles and sheaf cohomology, theory of algebraic curves. Weekly problem solving. MATH 200, MATH 201, MATH 202, and MATH 208 are recommended as preparation.

Prerequisite: Enrollment is restricted to graduate students.

MATH 223B - Algebraic Geometry II (5)

A continuation of course 223A. Topics include theory of schemes and sheaf cohomology, formulation of the Riemann-Roch theorem, birational maps, theory of surfaces. Weekly problem solving. MATH 223A is recommended as preparation.

Prerequisite: Enrollment is restricted to graduate students.

MATH 225A - Lie Algebras (5)

Basic concepts of Lie algebras. Engel's theorem, Lie's theorem, Weyl's theorem are proved. Root space decomposition for semi-simple algebras, root systems and the classification theorem for semi-simple algebras over the complex numbers. Isomorphism and conjugacy theorems.

Prerequisite: Prerequisite(s): MATH 201 and MATH 202 recommended as preparation Enrollment is restricted to graduate students.

MATH 225B - Infinite Dimensional Lie Algebras (5)

Finite dimensional semi-simple Lie algebras: PBW theorem, generators and relations, highest weight representations, Weyl character formula. Infinite dimensional Lie algebras: Heisenberg algebras, Virasoro algebras, loop algebras, affine Kac-Moody algebras, vertex operator representations.

Prerequisite: Prerequisite(s): MATH 225A. Enrollment is restricted to graduate students.

MATH 226A - Infinite Dimensional Lie Algebras and Quantum Field Theory I (5)

Introduction to the infinite-dimensional Lie algebras that arise in modern mathematics and mathematical physics: Heisenberg and Virasoro algebras, representations of the Heisenberg algebra, Verma modules over the Virasoro algebra, the Kac determinant formula, and unitary and discrete series representations.

Prerequisite: Enrollment is restricted to graduate students.

MATH 226B - Infinite Dimensional Lie Algebras and Quantum Field Theory II (5)

Continuation of MATH 226A: Kac-Moody and affine Lie algebras and their representations, integrable modules, representations via vertex operators, modular invariance of characters, and introduction to vertex operator algebras.

Prerequisite: Enrollment is restricted to graduate students.

MATH 227 - Lie Groups (5)

Lie groups and algebras, the exponential map, the adjoint action, Lie's three theorems, Lie subgroups, the maximal torus theorem, the Weyl group, some topology of Lie groups, some representation theory: Schur's Lemma, the Peter-Weyl theorem, roots, weights, classification of Lie groups, the classical groups.

Prerequisite: Prerequisite(s): MATH 200, MATH 201, MATH 204, and MATH 208. Enrollment is restricted to graduate students.

MATH 228 - Lie Incidence Geometries (5)

Linear incidence geometry is introduced. Linear and classical groups are reviewed, and geometries associated with projective and polar spaces are introduced. Characterizations are obtained.

Prerequisite: Enrollment is restricted to graduate students.

MATH 229 - Kac-Moody Algebras (5)

Theory of Kac-Moody algebras and their representations. The Weil-Kac character formula. Emphasis on representations of affine superalgebras by vertex operators. Connections to combinatorics, PDE, the monster group. The Virasoro algebra.

Prerequisite: Enrollment is restricted to graduate students.

MATH 232 - Morse Theory (5)

Classical Morse Theory. The fundamental theorems relating critical points to the topology of a manifold are treated in detail. The Bott Periodicity Theorem. A specialized course offered once every few years.

Prerequisite: Prerequisite(s): MATH 208, MATH 209, MATH 210, MATH 211, and MATH 212 recommended as preparation. Enrollment is restricted to graduate students.

MATH 233 - Random Matrix Theory (5)

Classical matrix ensembles; Wigner semi-circle law; method of moments. Gaussian ensembles. Method of orthogonal polynomials; Gaudin lemma. Distribution functions for spacings and largest eigenvalue. Asymptotics and Riemann-Hilbert problem. Painleve theory and the Tracy-Widom distribution. Selberg's Integral. Matrix ensembles related to classical groups; symmetric functions theory. Averages of characteristic polynomials. Fundamentals of free probability theory. Overview of connections with physics, combinatorics, and number theory.

Prerequisite: Prerequisite(s): MATH 103, MATH 204, and MATH 205; MATH 117 recommended as preparation. Enrollment is restricted to graduate students.

MATH 234 - Riemann Surfaces (5)

Riemann surfaces, conformal maps, harmonic forms, holomorphic forms, the Reimann-Roch theorem, the theory of moduli.

Prerequisite: Enrollment is restricted to graduate students.

MATH 235 - Dynamical Systems Theory (5)

An introduction to the qualitative theory of systems of ordinary differential equations. Structural stability, critical elements, stable manifolds, generic properties, bifurcations of generic arcs.

Prerequisite: Prerequisite(s): MATH 203 and MATH 208. Enrollment is restricted to graduate students.

MATH 238 - Elliptic Functions and Modular Forms (5)

The course, aimed at second-year graduate students, will cover the basic facts about elliptic functions and modular forms. The goal is to provide the student with foundations suitable for further work in advanced number theory, in conformal field theory, and in the theory of Riemann surfaces.

Prerequisite: Prerequisite(s): MATH 200, MATH 201, MATH 202, and either MATH 207 or MATH 103A are recommended as preparation. Enrollment is restricted to graduate students.

MATH 239 - Homological Algebra (5)

Homology and cohomology theories have proven to be powerful tools in many fields (topology, geometry, number theory, algebra). Independent of the field, these theories use the common language of homological algebra. The aim of this course is to acquaint the participants with basic concepts of category theory and homological algebra, as follows: chain

complexes, homology, homotopy, several (co)homology theories (topological spaces, manifolds, groups, algebras, Lie groups), projective and injective resolutions, derived functors (Ext and Tor). Depending on time, spectral sequences or derived categories may also be treated. MATH 200 and MATH 202 strongly recommended.

Prerequisite: Enrollment is restricted to graduate students.

MATH 240A - Representations of Finite Groups I (5)

Introduces ordinary representation theory of finite groups (over the complex numbers). Main topics are characters, orthogonality relations, character tables, induction and restriction, Frobenius reciprocity, Mackey's formula, Clifford theory, Schur indicator, Schur index, Artin's and Brauer's induction theorems. Recommended: successful completion of MATH 200-MATH 202.

Prerequisite: Enrollment is restricted to graduate students.

MATH 240B - Representations of Finite Groups II (5)

Introduces modular representation theory of finite groups (over a field of positive characteristic). Main topics are Grothendieck groups, Brauer characters, Brauer character table, projective covers, Brauer-Cartan triangle, relative projectivity, vertices, sources, Green correspondence, Green's indecomposability theorem. Recommended completion of MATH 200-MATH 203 and MATH 240A.

Prerequisite: Prerequisite(s): MATH 200, MATH 201, MATH 202, MATH 203, and MATH 240A recommended. Enrollment is restricted to graduate students.

MATH 246 - Representations of Algebras (5)

Material includes associative algebras and their modules; projective and injective modules; projective covers; injective hulls; Krull-Schmidt Theorem; Cartan matrix; semisimple algebras and modules; radical, simple algebras; symmetric algebras; quivers and their representations; Morita Theory; and basic algebras.

Prerequisite: Prerequisite(s): MATH 200, MATH 201, and MATH 202. Enrollment is restricted to graduate students.

MATH 248 - Symplectic Geometry (5)

Basic definitions. Darboux theorem. Basic examples: cotangent bundles, Kähler manifolds and co-adjoint orbits. Normal form theorems. Hamiltonian group actions, moment maps. Reduction by symmetry groups. Atiyah-Guillemin-Sternberg convexity. Introduction to Floer homological methods. Relations with other geometries including contact, Poisson, and Kähler geometry.

Prerequisite: Prerequisite(s): MATH 204; MATH 208 and MATH 209 are recommended as preparation. Enrollment is restricted to graduate students.

MATH 249A - Mechanics I (5)

Covers symplectic geometry and classical Hamiltonian dynamics. Some of the key subjects are the Darboux theorem, Poisson brackets, Hamiltonian and Lagrangian systems,

Legendre transformations, variational principles, Hamilton-Jacobi theory, geodesic equations, and an introduction to Poisson geometry. MATH 208 and MATH 209 are recommended as preparation.

Prerequisite: MATH 208 and MATH 209 recommended as preparation. Enrollment is restricted to graduate students.

MATH 249B - Mechanics II (5)

Hamiltonian dynamics with symmetry. Key topics center around the momentum map and the theory of reduction in both the symplectic and Poisson context. Applications are taken from geometry, rigid body dynamics, and continuum mechanics. MATH 249A is recommended as preparation.

Prerequisite: Enrollment is restricted to graduate students.

MATH 249C - Mechanics III (5)

Introduces students to active research topics tailored according to the interests of the students. Possible subjects are complete integrability and Kac-Moody Lie algebras; Smale's topological program and bifurcation theory; KAM theory, stability and chaos; relativity; quantization. MATH 249B is recommended as preparation.

Prerequisite: Enrollment is restricted to graduate students.

MATH 252 - Fluid Mechanics (5)

First covers a basic introduction to fluid dynamics equations and then focuses on different aspects of the solutions to the Navier-Stokes equations.

Prerequisite: Prerequisite(s): MATH 106 and MATH 107 are recommended as preparation. Enrollment is restricted to graduate students.

MATH 254 - Geometric Analysis (5)

Introduction to some basics in geometric analysis through the discussions of two fundamental problems in geometry: the resolution of the Yamabe problem and the study of harmonic maps. The analytic aspects of these problems include Sobolev spaces, best constants in Sobolev inequalities, and regularity and a priori estimates of systems of elliptic PDE.

Prerequisite: MATH 204, MATH 205, MATH 209, MATH 212, and MATH 213A recommended as preparation. Enrollment is restricted to graduate students.

MATH 256 - Algebraic Curves (5)

Introduction to compact Riemann surfaces and algebraic geometry via an in-depth study of complex algebraic curves.

Prerequisite: MATH 200, MATH 201, MATH 202, MATH 203, MATH 204, and MATH 207 are recommended as preparation. Enrollment is restricted to graduate mathematics and physics students.

MATH 260 - Combinatorics (5)

Combinatorial mathematics, including summation methods, binomial coefficients, combinatorial sequences (Fibonacci, Stirling, Eulerian, harmonic, Bernoulli numbers), generating

functions and their uses, Bernoulli processes and other topics in discrete probability. Oriented toward problem solving applications. Applications to statistical physics and computer science.

Prerequisite: Enrollment is restricted to graduate students.

MATH 264 - Inverse Problems and Integral Geometry (5)

Concepts of inverse problem and ill-posedness on the Hilbert scale. Approaches to inversion, regularization and implementation. In Euclidean geometry: Radon transform; X-ray transform; attenuated X-ray transform (Novikov's inversion formula); weighted transforms. Same topics in different geometric contexts: homogeneous spaces, manifolds with boundary. Non-linear problems: boundary rigidity, lens rigidity, inverse problems for connections. MATH 148, MATH 204, MATH 205, MATH 206, and MATH 208, are recommended for preparation.

Prerequisite: Enrollment is restricted to graduate students.

MATH 280 - Topics in Analysis (5)

Prerequisite: Enrollment is restricted to graduate students.

MATH 281 - Topics in Algebra (5)

Prerequisite: Enrollment is restricted to graduate students.

MATH 282 - Topics in Geometry (5)

Prerequisite: Enrollment is restricted to graduate students.

MATH 283 - Topics in Combinatorial Theory (5)

Prerequisite: Enrollment is restricted to graduate students.

MATH 284 - Topics in Dynamics (5)

Prerequisite: Enrollment is restricted to graduate students.

MATH 285 - Topics in Partial Differential Equations (5)

Topics such as derivation of the Navier-Stokes equations. Examples of flows including water waves, vortex motion, and boundary layers. Introductory functional analysis of the Navier-Stokes equation.

Prerequisite: Enrollment is restricted to graduate students.

MATH 286 - Topics in Number Theory (5)

Topics in number theory, selected by instructor. Possibilities include modular and automorphic forms, elliptic curves, algebraic number theory, local fields, the trace formula. May also cover related areas of arithmetic algebraic geometry, harmonic analysis, and representation theory. Courses 200, 201, 202, and 205 are recommended as preparation.

Prerequisite: Enrollment is restricted to graduate students.

MATH 287 - Topics in Topology (5)

Topics in topology, selected by the instructor. Possibilities include generalized (co)homology theory including K-theory, group actions on manifolds, equivariant and orbifold cohomology theory.

Prerequisite: Enrollment is restricted to graduate students.

MATH 288A - Pedagogy of Mathematics (2)

Prepares graduate students to become successful Teaching Assistants in mathematics courses. Topics include class management, assessment creation, evaluation and grading, student interaction, introduction to teaching and learning strategies, innovation in education, use of technology, and best practices that promote diversity and inclusion.

Prerequisite: Enrollment is restricted to graduate students.

MATH 288B - Pedagogy of Mathematics (2)

Prepares graduate students to become successful Graduate Student Instructors in mathematics. Topics include class management, assessment creation, evaluation and grading, student interaction, introduction to teaching and learning strategies, innovation in education, use of technology, and best practices that promote diversity and inclusion.

Prerequisite: Enrollment is restricted to graduate students.

MATH 292 - Seminar (0)

A weekly seminar attended by faculty, graduate students, and upper-division undergraduate students. All graduate students are expected to attend.

Prerequisite: Enrollment is restricted to graduate students.

MATH 296 - Special Student Seminar (5)

Students and staff studying in an area where there is no specific course offering at that time.

Prerequisite: Enrollment is restricted to graduate students.

MATH 297A - Independent Study (5)

Either study related to a course being taken or a totally independent study. Enrollment restricted to graduate students.

MATH 297B - Independent Study (10)

Either study related to a course being taken or a totally independent study. Enrollment restricted to graduate students.

MATH 297C - Independent Study (15)

Either study related to a course being taken or a totally independent study. Enrollment restricted to graduate students.

MATH 298 - Master's Thesis Research (5)

Enrollment restricted to graduate students.

MATH 299A - Thesis Research (5)

Enrollment restricted to graduate students.

MATH 299B - Thesis Research (10)

Enrollment restricted to graduate students.

MATH 299C - Thesis Research (15)

Enrollment restricted to graduate students.

MERR - MERRILL COLLEGE

Lower-Division

MERR 1 - Academic Literacy and Ethos: Reading Ourselves, Reading the World (5)

Teaches foundational concepts for intellectual exploration and personal development within an academic community: analysis, critical thinking, metacognition, engagement with others across difference, and self-efficacy. Engages students in Merrill's intellectual tradition of investigating social change and social justice.

Prerequisite: Enrollment is restricted to first-year college members.

MERR 1A - Introduction to University Life and Learning (1)

Orientation to and exploration of the nature of the liberal arts, and of learning at research universities. Topics include: academic planning for upper-division coursework; enrollment processes; and understanding pathways to degree completion; UCSC resources that support health and well-being strategies for academic success; the cultivation of just communities; the prevention of sexual harassment and violence; campus conduct policies; awareness of risks associated with drug and/or alcohol use; and an introduction to traditions of community-engaged learning, ground-breaking research, and interdisciplinary thinking that define a UC Santa Cruz degree. This course can be taken for Pass/No Pass grading only.

Prerequisite: Enrollment is restricted to entering first-year Merrill College students.

MERR 5 - WORD: Writing Originating from Reading and Discussion. (2)

Designed to provide students with practice using critical reading strategies with a variety of academic texts and genres and is graded Pass/No Pass only. Enrollment is restricted to frosh students and by permission of the instructor.

MERR 31F - Agency, Dialogue, Action: Fostering Critical Engagement (2)

What exactly does it mean to have agency, what do we do with agency? Course examines theories of agency, in education and elsewhere, and engages students in opportunities to enact and examine effective approaches. Understanding that spaces of social collaboration are also learning environments, students investigate how different models of student engagement promote agency ultimately leading to investigating how we can utilize our agency to effect change and how dialogue plays an integral role in this process. Also explores effective practices for fostering and implementing agency and communication, and the theories from which these practices emerge. Enrollment is by permission and is restricted to students who are a member of a SOMeCA organization. (Formerly MERR 31.)

MERR 32F - Mindful Collaboration: Cultivating Radical

Exchange (2)

Collaboration can be challenging, particularly in a society in which there is an emphasis on individualism and competitiveness. Compromise, for example, can be experienced or interpreted as personal sacrifice rather than fertile ground for possibility. Solving many of the world's most significant issues (climate change, economic instability, pandemic, etc.) will require collective effort and this will challenge us to create new ways of being and thinking. Through classroom discussions, journal reflections, and experiential exercises, students investigate models of collaboration, how social inequities can challenge collaborative work, the importance of common purpose, practices that support respectful and inclusive deliberation, and student organizations as sites of collaboration. Enrollment is by permission and is restricted to students who are a member of a SOMECA organization.

MERR 33F - Transformative Leadership and Social Change (2)

Examines current state of constant division and dissent to look for solutions to society's largest problems and examples of leadership that exhibit the compassion, openness, and skills needed to reach inclusive and genuine consensus that students can learn from in becoming effective and transformative leaders. Students challenge their own assumptions regarding leadership and explore and assess different means through which they can be leaders who facilitate change with more than just their own ideas in mind. Through both class discussions and interactive practices, students explore ways of strengthening interpersonal relationships, developing shared frameworks, and creating a collective consensus that supports sustainable and inclusive change. Enrollment is by permission and is restricted to students who are a member of a SOMECA organization.

MERR 34F - Careers in STEM (2)

Provides students with information, tools, and strategies to embark on STEM career exploration and preparation, including strategies for addressing challenges and opportunities related to diversity within STEM career fields. Students explore their career values, network with guest speakers in STEM fields (alumni, faculty, postdocs, graduate students, career coaches, and hiring managers), and prepare and create career-related documents (resumes, cover letters, networking plans). Enrollment is restricted to sophomore and junior STEM majors and proposed STEM majors, and by instructor permission. Students in the EOP program are given priority.

Prerequisite: Enrollment is restricted to sophomore and junior STEM majors and intended STEM majors, and by instructor permission. Students in the EOP program are given priority.

MERR 40 - Deafness & Sign Language (5)

Explores what we can learn about the human mind and brain by studying sensory loss and language in a different sensory modality. Topics include visual and spatial thinking, brain organization, compensating for sensory loss, and the nature of human language.

MERR 41 - Pandemic Case Studies: Principles in Public Health

(5)

Examines the coronavirus pandemic using public health principles to gain better understanding of its causes, pathways, and social dynamics. Students compare and contrast the current pandemic with historical pandemic events using case study analysis and the application of public health concepts, in order to understand the coronavirus pandemic within a broader perspective of health, society, and human behavior.

MERR 50 - Merrill Alumni Careers in Public Service (2)

Course focuses on careers in public service--why choose one, how to prepare for one.

Prerequisite: Enrollment is restricted to college members.

MERR 85B - Merrill Classroom Connection Field Study (3)

Supervised hands-on experience assisting in local K-12 school classrooms. Students attend UCSC class meetings, complete relevant readings in educational theory, and present a final assignment. This course requires more hours than MERR 85C and involves travel to Pescadero twice per week.

Prerequisite: Priority enrollment restricted to Merrill College members.

MERR 85C - Merrill Classroom Connection Field Study (2)

Supervised hands-on experience assisting in local K-12 school classrooms. Students also attend UCSC course meetings, complete relevant readings in educational theory, and present a final assignment. Please see <http://merrill.ucsc.edu/academics/programs-and-courses/classroom-connection/index.html> for conditions that must be met prior to placement at local schools.

Prerequisite: Priority enrollment is restricted to Merrill College members.

MERR 90 - Theory and Practice of Field Study (5)

Course provides an opportunity for lower-division students to learn about Santa Cruz, Calif., its contemporary history, culture, and politics through classroom theoretical learning integrated with individual field studies. Course also examines social change, qualitative research, and community organizing.

Prerequisite: Enrollment is restricted to College Scholar Students.

MERR 90F - Merrill Field Study Practicum (2)

Offers Merrill students an opportunity for practical field study experience with preparation and support for practical skill development and critical reflection on service-learning experience.

Prerequisite: Enrollment is restricted to sophomore, junior, and senior college members.

MERR 90S - Theory and Practice of Field Study (2)

Students spend 10 hours a week on an internship they choose, with the support of the instructor, working with a local

organization. Includes class lectures and discussions of readings.

MERR 93 - Field Study (5)

Provides for individual programs of study sponsored by the college and performed off campus. Up to three such courses may be taken for credit in any one quarter. Approval of student's adviser and provost required.

MERR 93F - Field Study (2)

Provides for individual program of study sponsored by the college and performed off campus. Approval of instructor required.

MERR 93G - Field Study (3)

Provides for individual programs of study sponsored by the college and performed off campus. Approval of instructor required.

MERR 98F - Independent Study (2)

Independent Study

MERR 99 - Tutorial (5)

Various topics to be arranged between student and instructor. Students submit petition to sponsoring agency.

MERR 99F - Tutorial (2)

Various topics to be arranged between student and instructor. Students submit petition to sponsoring agency.

Upper-Division

MERR 120 - Personal Empowerment (5)

Intensive course on individual goal-oriented behavior, commonly called problem solving. Focus on purpose, goals, meaning, emotions, languages, model-building, reality, thinking, logic, creativity, the steps of problem solving, common blocks, and techniques of unblocking. Meet with instructor prior to advance enrollment; priority given to upper-level students.

MERR 180 - Research Skills for College and Beyond (2)

Focuses on exploration/development of skills for planning, study habits, research, networking, and communication skills for college, graduate and professional school, and beyond. Primary focus is on writing, public speaking, and academic and professional research.

Prerequisite: Enrollment is restricted to junior and senior college members.

MERR 183F - Focus on Africa (2)

Equips students with the skills and background necessary to be informed observers and chroniclers of current affairs on the African continent.

MERR 192 - Directed Student Teaching (5)

Teaching of a lower-division seminar by an upper-division student under faculty supervision. (See MERR 42.) Students submit petition to sponsoring agency, supported by faculty member willing to supervise.

MERR 193 - Field Study (5)

Provides for individual programs of study sponsored by the college and performed off campus. Up to three such courses may be taken for credit in one quarter. Approval of student's adviser and provost required.

MERR 193F - Field Study (2)

Provides for individual programs of study sponsored by the college and performed off campus. Up to three such courses may be taken for credit in one quarter. Approval of student's adviser and provost required.

MERR 193G - Field Study (3)

Provides for individual programs of study sponsored by the college and performed off campus. Up to three such courses may be taken for credit in one quarter. Approval of student's adviser and provost required.

MERR 194 - Group Tutorial (5)

A program of independent study arranged between a group of students and a faculty member.

MERR 195 - Senior Research Project (5)

Students submit petition to sponsoring agency.

MERR 198 - Independent Field Study (5)

Provides for college-sponsored individual study programs off campus, for which faculty supervision is not in person (e.g., supervision is by correspondence). Up to three such courses may be taken for credit in any one quarter. This may be a multiple-term course extending over two or three quarters; in this case the grade and evaluation submitted for the final quarter apply to all previous quarters. Petitions may be obtained at the Merrill College Office. Approval of student's adviser, certification of adequate preparation, and approval by the Merrill Provost required.

MERR 198F - Independent Study (2)

Independent Study

MERR 199 - Tutorial (5)

Various topics to be arranged between student and instructor. Students submit petition to sponsoring agency.

METX - MICROBIOLOGY AND

ENVIRONMENTAL TOXICOLOGY

Lower-Division

METX 80E - Aquatic Toxicology (5)

An introduction to the sources, cycling, and impacts of toxicants in aquatic systems, including acid rain, ground water, fresh water rivers and lakes, estuaries, and the ocean. Emphasis is on the properties of toxic chemicals that influence their biogeochemical cycles and factors that influence their toxicity to aquatic organisms and humans.

Upper-Division

METX 100 - Introduction to Microbiology (5)

Introduces the biology of microorganisms (bacteria, archaea, viruses, fungi, and unicellular eukaryotes), with an emphasis on bacteria. Topics include microbial cell structure and function, physiology, metabolism, genetics, and diversity. Also considers the role of microbes in human health, the environment, biotechnology, and food production. Students cannot receive credit for both this course and METX 119.

Prerequisite: Prerequisite(s): BIOL 20A.

METX 101 - Sources and Fates of Pollutants (5)

Presents in-depth important principles of environmental toxicology related to the introduction, transport, and fate of toxicants in aquatic and terrestrial environments, including environmental chemistry and biogeochemical cycles as well as exposure pathways and uptake by organisms. Additional emphasis placed on susceptibility and effects of toxicants across organ systems, toxicokinetic and biomarkers of exposure, and effects at the ecosystem level. Students cannot receive credit for this course and METX 201.

METX 102 - Cell and Molecular Toxicology (5)

Emphases of biochemical, cellular, and organ system basis of intoxication, including dose-response relationships, biotransformation of toxicants, biochemical mechanisms underlying toxicity, factors influencing toxic action, and biomarkers of exposure. Emphasizes effects of various classes of toxins, including heavy metals and persistent synthetic organics, with a focus on susceptible biochemical/cellular processes of the central nervous, immune, hepatic, and renal target organ systems. Designed for advanced undergraduates. Students cannot receive credit for this course and METX 202. (Formerly Cellular and Organismal Toxicology.)

Prerequisite: Prerequisite(s): BIOL 20A and BIOE 20B or equivalent; BIOL 100 and BIOC 110 recommended. Enrollment restricted to juniors and seniors.

METX 115 - Environmental Health Science (5)

Addresses challenges related to environmental health, their impact on the health of biological structures, and humans as active elements in the process of environmental degradation, and as passive elements as well. Students discuss events as case studies of environmental health that contributed to

environmental protection, and disease control and prevention. Course involves collaborative endeavor in which students develop a group assignment throughout the 10 weeks of the course that is evaluated at the end of the course.

Prerequisite: Prerequisite(s): BIOL 20A and ENVS 23.

METX 119 - Microbiology (5)

Cell and molecular biology of bacteria and their viruses, including applications in medicine, public health, agriculture, and biotechnology. Students cannot receive credit for both this course and METX 100.

Prerequisite: Prerequisite(s): BIOC 100A or BIOL 101 or BIOL 100 or CHEM 103.

METX 119L - Microbiology Laboratory (5)

An introduction to the principles and practices of laboratory microbiology, with a substantial presentation of optical microscopy.

Prerequisite: Prerequisites: Satisfaction of Entry Level Writing and Composition requirements; and one course from the following: BIOL 20L, or BIOL 101L, or BIOL 102L; and previous or concurrent enrollment in METX 100 or METX 119. Enrollment is restricted to declared Biochemistry and Molecular Biology; Biology B.S.; Molecular, Cell and Developmental Biology, and Neuroscience majors. Other majors may enroll by permission of the instructor. Students cannot enroll in METX 119L after receiving credit with a 'C' or better in BIOL 100L, BIOL 103L, BIOL 105L, BIOL 106L, BIOL 108L, BIOL 109L, BIOL 115L, BIOL 120L, BIOL 121L, BIOL 129L, and BIOL 186L.

METX 125 - Practicing Safe Science (2)

Introduces research safety principles and practices. Instructors and guest experts discuss research hazards and control measures. Students explore the safe use of research methods and materials via hands-on and outside exercises. Issues include compliance with hazardous waste and other environmental safety regulations.

METX 135 - Functional Anatomy (5)

A rigorous systems-based course in anatomy. Lectures provide an overview of functional anatomy at all levels from the systems to the tissues. Provides a mechanistic understanding of the structures of the body as a foundation for human-health oriented studies.

Prerequisite: Prerequisite(s): BIOL 20A and BIOE 20B. Concurrent enrollment in METX 135L is required. Enrollment restricted to biological sciences majors and affiliated majors and biology minors.

METX 135C - Cadaver Dissection Laboratory (2)

Dissection of a human cadaver under the direction of an anatomy instructor.

Prerequisite: Prerequisite(s): METX 135 and METX 135L, or ANTH 102A.

METX 135L - Functional Anatomy Lab (2)

Complements lecture course 135. Emphasizes nomenclature and recognition; includes the embryology and histology of bones, muscles, and internal organs, and the interactions between the systems of the body.

Prerequisite: Prerequisite(s): BIOL 20A and BIOE 20B. Enrollment restricted to biological sciences majors and affiliated majors and biology minors. Concurrent enrollment in METX 135 is required.

METX 140 - Molecular Biology and Microbial Genetics (5)

Introduces students to the field of molecular biology and microbial genetics. Covers the following topics: molecular mechanisms of DNA replication, transcription, translation, regulatory systems controlling replication, transcription, and translation; basic genetic principles with an emphasis on bacterial genetics; molecular biology and microbial genetics approaches used to understand the molecular mechanisms of interaction of microorganisms with their surroundings and other organisms; and experimental methods employing molecular biology and molecular genetics and biotechnology applications which have arisen from discoveries of bacterial mechanisms.

Prerequisite: Prerequisite(s): BIOL 100 or BIOC 100A.

METX 144 - Groundwater Contamination (5)

Analyses of contemporary problems in groundwater contamination, based on current scientific understanding of contaminant transport in aquifers. Topics include both theoretical concepts and case studies.

Prerequisite: Prerequisite(s): EART 110B.

METX 145 - Medical Geology (5)

An interdisciplinary analysis of natural geochemical processes that impact human health and of anthropogenic processes that exacerbate those impacts.

Prerequisite: Prerequisite(s): CHEM 1A, CHEM 1B, CHEM 1C, CHEM 1M, and CHEM 1N.

METX 150 - Introduction to Research and Experimental Design (5)

Lecture-based course for advanced undergraduates actively engaged in undergraduate research (e.g., independent study or senior thesis). Emphasizes basic lab skills, including laboratory safety and handling of laboratory equipment; experimental design; scientific record keeping; and literature searching, review, and management.

METX 151 - Scientific Writing and Presentation (5)

For advanced undergraduates who are actively engaged in undergraduate research (e.g., independent study or senior thesis). Emphasizes the collection, reduction, analysis, management, and interpretation of scientific data; the presentation of scientific data in written and oral formats; and further development of critical thinking.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

METX 160 - Coastal Environmental Toxicology and Policy (3)

Interdisciplinary analysis of the scientific basis and policy development to regulate and manage environmental pollutants in coastal waters. Focuses on case studies involving aspects of environmental toxicology and policy including environmental monitoring and regulatory programs; ecosystem restoration; and regulating the environmental impacts of coastal development.

Prerequisite: Enrollment restricted to sophomores, juniors, seniors, and graduate students.

METX 170 - Drug Action and Development (5)

Lectures and case studies explore principles and approaches in drug discovery and development, emphasizing concepts in pharmacology; medicinal chemistry; and genomics- and bioinformatics-based approaches to drug discovery to illustrate pathways from discovery through development for clinical use. Cannot receive credit for this course and METX 270.

Prerequisite: Prerequisite(s): BIOL 100 or CHEM 103 or BIOC 100A; BIOL 110, and BIOL 130 and BIOL 130L or BIOE 131 and BIOE 131L are recommended. Enrollment restricted to juniors and seniors.

METX 195 - Senior Thesis (5)

An individually supervised course, with emphasis on independent research culminating in a senior thesis.

METX 195F - Senior Thesis (2)

An individually supervised course with emphasis on independent research culminating in a senior thesis.

METX 198 - Independent Study (5)

Provides for individual programs of study (a) by means other than the usual supervision in person or (b) when the student is doing all or most of the coursework off campus. With permission of the department, two or three courses may be taken concurrently, or the course repeated for credit.

METX 198F - Independent Study (2)

Provides for individual programs of study (a) by means other than the usual supervision in person or (b) when the student is doing all or most of the coursework off campus. With permission of the department, two or three courses may be taken concurrently, or the course repeated for credit.

METX 199 - Tutorial (5)

Reading, discussion, written reports, and laboratory research on selected topics.

METX 199F - Tutorial (2)

Reading, discussion, written reports, and laboratory research on selected topics.

Graduate

METX 200 - Interdisciplinary Approaches in Environmental Toxicology (5)

Introduction to interdisciplinary, case-based approaches to problem-solving. Demonstrates how important, current problems in environmental and human health have been addressed and solved. Presents assigned problems that integrate the different organization levels (environmental, molecular/cellular, organismal/public health) inherent to environmental and human health. Students work in collaborative teams to analyze each problem and create a proposal for a research plan/solution. This course must be taken for a letter grade.

Prerequisite: Enrollment is restricted to graduate students. Advanced undergraduates may enroll by permission of the instructor.

METX 201 - Sources and Fates of Pollutants (5)

Presents in-depth important principles of environmental toxicology related to the introduction, transport, and fate of toxicants in aquatic and terrestrial environments including environmental chemistry and biogeochemical cycles as well as exposure pathways and uptake by organisms. Additional emphasis will be placed on the susceptibility and effects of toxicants across organ systems, toxicokinetics and biomarkers of exposure, and effects at the ecosystem level. Students cannot receive credit for this course and METX 101.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduate science majors may enroll with permission of instructor.

METX 202 - Cell and Molecular Toxicology (5)

Emphasizes biochemical, cellular, and organ system basis of intoxication, including dose-response relationships, biotransformation of toxicants, biochemical mechanisms underlying toxicity, factors influencing toxic action, and biomarkers of exposure. Emphasizes effects of various classes of toxins, including heavy metals and persistent synthetic organics, with a focus on susceptible biochemical/cellular processes of the central nervous, immune, hepatic, and renal target organ systems. Students cannot receive credit for this course and METX 102 or BIOL 122.

Prerequisite: Enrollment is restricted to graduate students.

METX 203 - Cellular and Molecular Toxicology (5)

Presents in-depth cellular and molecular principles of environmental toxicology. These include modes of action and cellular and molecular targets of toxicants, as well as mechanisms of cellular and molecular responses to toxicants and their detoxification. State-of-the-art biological methodologies and approaches to identify and study cellular targets of toxicants. Designed to provide students with a broad and deep understanding of the biological aspects of toxicology at both cellular and molecular levels, and the skills to approach emerging challenges in the field.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with instructor's permission.

METX 205 - Scientific Grant Writing (5)

Provides fundamental training of graduate students in the scientific method; experimental design; ethics in science; grant proposal and scientific writing; and data presentation and scientific speaking. Students are evaluated on class participation, performance, and a written NIH/NSF-style research proposal. (Formerly Scientific Skills, Ethics, and Writing.)

Prerequisite: Enrollment restricted to graduate students. Advanced undergraduates may enroll with permission of the instructor.

METX 206A - Advanced Microbiology (5)

Focuses on aspects of bacterial molecular biology. Covers four main areas: (1) metabolism-catabolism, anabolism, building-block precursors; (2) transcription/signal transduction; (3) replication/plasmid biology/division; (4) translation/protein processing/secretion/cell structure. Strong focus on experimental techniques and approaches used in molecular biology, and on model bacteria, such as *Escherichia coli* and *Bacillus subtilis*.

Prerequisite: Enrollment is restricted to graduate students. Advanced undergraduates may enroll with permission of instructor.

METX 210 - Molecular and Cellular Basis of Bacterial Pathogenesis (5)

Focuses on the molecular basis of bacterial pathogenesis with specific emphasis on gene expression, regulation, and ecology and evolution.

Prerequisite: Enrollment is restricted to graduate students. Advanced undergraduates with extensive background in microbiology and biology may enroll with permission of instructor.

METX 215 - Antibiotics: Actions and Resistance (3)

Critical review of scientific literature covering genetic and physiological mechanisms conferring resistance to antibiotics and their spread in the population. Format based on structured discussion of selected topics and original research proposal.

Prerequisite: Prerequisite(s): METX 206A or METX 119, or by permission of the instructor. Enrollment is restricted to graduate students.

METX 238 - Pathogenesis: Molecular Mechanisms of Disease (5)

Provides an overview of the mammalian innate immune response and the role of inflammation in disease. Also, presents how both environmental stressors and microbial pathogens impact inflammation.

Prerequisite: Enrollment is restricted to graduate students.

METX 240 - Molecular Biology of Prokaryotes (5)

Focuses on several aspects of prokaryotic molecular biology. Covers transcriptional regulation, translational regulation, DNA replication and segregation, protein secretion, transport of small molecules, control of metabolism, stress response, bacterial differentiation, signal transduction, biofilm formation, and motility. Strong focus on experimental techniques and approaches used in prokaryotic molecular biology. Focus on model bacteria such as *Escherichia coli* and *Bacillus subtilis*. Students cannot receive credit for this course and METX 140.

METX 245A - Scientific Communication in Microbiology and Environmental Toxicology A (5)

Introduces multiple forms of scientific presentation and communication to graduate students. Students learn to craft and deliver multiple types of written and visual communications, including formal and informal modes, on a topic developed as part of the class.

Prerequisite: Prerequisite(s): METX 200. Enrollment is restricted to graduate students.

METX 245B - Scientific Communication in Microbiology and Environmental Toxicology B (5)

Continuation of METX 245A. Students develop and refine a capstone in-depth report in a written form and as an oral presentation.

Prerequisite: Prerequisite(s): METX 245A. Enrollment is restricted to graduate students.

METX 250 - Environmental Microbiology (5)

How microbes interact with their environments. Topics include anaerobic metabolism; biotransformation of toxic metals and organic pollutants; geomicrobiology; life in extreme environments; water quality. Advanced undergraduates with extensive background in microbiology and biology may enroll with permission of instructor.

Prerequisite: Enrollment is restricted to graduate students.

METX 270 - Drug Action and Development (5)

Lectures and case studies explore principles and approaches in drug discovery and development, emphasizing concepts in pharmacology; medicinal chemistry; and genomics- and bioinformatics-based approaches to drug discovery to illustrate pathways from discovery through development for clinical use. Cannot receive credit for this course and course 170. (Formerly Frontiers in Drug Action and Discovery.)

Prerequisite: Enrollment is restricted to graduate students.

METX 281A - Topics in Environmental Toxicology (5)

Selected topics in environmental toxicology. Topics vary from year to year.

Prerequisite: Enrollment is restricted to graduate students; qualified upper-division science majors may enroll with instructor's permission.

METX 281C - Topics in Environmental Microbiology (2)

Seminar and discussion focusing on mechanism of microbial transformation of metals. Participants present results from their research projects in a seminar format. Relevant journal articles presented and discussed.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with instructor's permission.

METX 281F - Topics in Aquatic Toxicology (2)

Analyses of the sources and fates of aquatic pollutants. Discussions on processes at the air-water interface, within the water column, and in aquatic sediments. Topics vary from year to year.

Prerequisite: Enrollment is restricted to graduate students; qualified upper-division science majors may enroll with instructor's permission.

METX 281J - Mechanisms of Virulence and Resistance to Infectious Disease (2)

Research seminar focusing on the mechanisms underlying host resistance or susceptibility to infectious diseases, and virulence strategies utilized by bacterial pathogens. Participants are required to present results from their own research and relevant journal articles.

Prerequisite: Enrollment is restricted to graduate students. Qualified undergraduate students may enroll with instructor's permission.

METX 281M - Topics in Molecular Toxicology (2)

Seminar and discussion on the mechanisms of toxicity in DNA alkylating agents. Participants present results from their research, and relevant journal articles are discussed.

Prerequisite: Enrollment is restricted to graduate students. Undergraduates may enroll with instructor's permission.

METX 281O - Topics in Bacterial Pathogenesis (2)

Intensive seminar focusing on mechanisms of bacterial pathogenesis of the ulcer-causing bacterium *Helicobacter pylori*. Participants are required to present results from their own research and relevant journal articles.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with permission of instructor.

METX 281P - Origins and Applications of Human Gut Microbial Symbiosis (2)

Research seminar focusing on how beneficial and harmful bacterial species living in the human intestine compete with one another for nutrients in food, and how our immune systems influence the outcomes of these competitions. Emphasis is placed on the evolution of relationships between organisms. Discussion will include genetic, biochemical, bioinformatic, and immunological methods for advancing knowledge about the impacts of microbes on host health. Participants are required to

present results from their own research, analyze current literature, and develop future aims for their studies. All lab members of the Patnode Lab are required to take this course.

Prerequisite: Enrollment is restricted to graduate students. Qualified undergraduate students may enroll with instructor's permission.

METX 281R - Topics in Genome-Environment Interactions (2)

Intensive research seminar focusing on the effects of exposure to environmental agents and multigenerational epigenetic inheritance of disease. Participants are required to present results from their own research and relevant journal articles.

Prerequisite: Enrollment is restricted to graduate students. Qualified undergraduate students may enroll with instructor's permission.

METX 281S - Cellular and Organismal Responses to Toxicants (2)

Intensive research seminar on the concepts, theory, and techniques in deriving physiologically based pharmacokinetic models of toxin exposure, metabolism, and efficacy of therapeutic treatment in mammalian models of human metal toxicity.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with permission of instructor.

METX 281V - Topics in Bacterial Pathogenesis and Innate Immunity (2)

Focuses on the interplay between the human gut bacterial pathogen *Yersinia pseudotuberculosis* and the innate immune system of the host. Participants are required to present the goals, results, and conclusions from their own research. Participation in the general discussion during others' presentations is also required.

Prerequisite: Enrollment is restricted to graduate students. Qualified undergraduates performing research under the supervision of the instructor may enroll with instructor's permission.

METX 281Y - Biofilms: Processes and Regulation (2)

Intensive seminar series focusing on the most current work on genes and the processes that regulate biofilm development dynamics as well as on the recent developments on visualization of biofilms. Presentation and discussion based.

Prerequisite: Enrollment is restricted to graduate students. Qualified undergraduate students may enroll with instructor's permission.

METX 282 - Current Approaches to Molecular Pathogenesis (2)

Graduate level seminar focusing on the mechanisms by which bacterial pathogens cause disease. Specific topics include basic concepts of virulence and virulence factors, virulence factor regulation, toxins, and interactions of pathogens with mammalian cells and organs. Discussions focus on several key

pathogens, including *Helicobacter pylori*, *Vibrio cholerae*, *Salmonella typhimurium*, and *Listeria monocytogenes*.

METX 290 - Proseminar (5)

Special topics offered from time to time by faculty, visiting professors, or staff members.

Prerequisite: Enrollment is restricted to graduate students; qualified undergraduates may enroll with instructor's permission.

METX 290A - Epidemiology and Risk Assessment (5)

Approaches different techniques of biological monitoring and the exposure and effect of biomarkers related to occupational and environmental exposure to chemicals. Available methods for risk assessment and identification of protective exposure limits also considered.

METX 292 - Introductory Graduate Seminar (0)

Weekly seminars by academic and research faculty on their areas of special interest. Students write weekly abstracts on articles covered by the seminars. This course can be taken for Satisfactory/Unsatisfactory credit only.

Prerequisite: Enrollment is restricted to graduate students.

METX 297A - Independent Study (5)

Independent study for graduate students who have not yet settled on a research area for the thesis. Students submit petition to sponsoring agency.

METX 297B - Independent Study (10)

Independent study for graduate students who have not yet settled on a research area for the thesis. Students submit petition to sponsoring agency.

METX 297C - Independent Study (15)

Independent study for graduate students who have not yet settled on a research area for the thesis. Students submit petition to sponsoring agency.

METX 299A - Thesis Research (5)

Students submit petition to sponsoring agency.

METX 299B - Thesis Research (10)

Students submit petition to sponsoring agency.

METX 299C - Thesis Research (15)

Students submit petition to sponsoring agency.

MUSC - MUSIC

Lower-Division

MUSC 1C - University Concert Choir (2)

A study of selected works for mixed chorus, with emphasis on masterworks for chorus and orchestra, culminating in one or

more public concerts. Familiarity with basic music notation recommended. Admission by audition with conductor prior to first class meeting.

MUSC 2 - University Orchestra (2)

A study of selected works for orchestra, culminating in one or more public concerts. Admission by audition with conductor prior to first class meeting.

MUSC 3 - Large Jazz Ensemble (2)

Instruction in performance in large jazz ensembles with written arrangements. Prepares a specific repertory for public performance. Admission by audition with conductor prior to first class meeting.

MUSC 5A - West Javanese Gamelan Ensemble: Beginning (2)

Instruction in practice and performance of gamelan music from Java or Sunda. Preparation of several works for public presentation.

MUSC 5B - West Javanese Gamelan Ensemble: Intermediate (2)

Instruction in practice and performance of gamelan music from Java or Sunda. Preparation of several works for public presentation. Attend first class meeting.

MUSC 5C - West Javanese Gamelan Ensemble: Advanced (2)

Instruction in practice and performance of gamelan music from Java or Sunda. Preparation of several works for public presentation. Attend first class meeting.

MUSC 6 - Classical Guitar Ensemble (2)

Study of selected repertoire and instruction in performance for classical guitar ensemble. Ensembles for guitar and other instruments will prepare works for public performances both on and off campus. All students enrolled in individual guitar lessons are expected to enroll. Students of other instruments or voice may also audition. Some additional rehearsal time, individually and with the group, is required. Admission by audition with instructor prior to first class meeting.

MUSC 7 - Music, Mind, Evolution, Language (5)

An interdisciplinary examination of various topics and issues in music, featuring an array of guest speakers. Part of the spring quarter Arts Division Dean's Lecture Series.

MUSC 8A - Beginning Balinese Gamelan (2)

Instruction in Balinese gamelan. Utilizes pitched percussion instruments to learn highly ornate and complex pieces through rote learning; students are not required to read music. Focuses on traditional repertoire and basic gamelan techniques for public performance. Enrollment by permission of the instructor at the first class meeting.

MUSC 8B - Advanced Balinese Gamelan (2)

Instruction in Balinese gamelan. Utilizes pitched percussion instruments to learn highly ornate and complex pieces through rote learning; students are not required to read music. Focuses

on advanced traditional and contemporary repertoire for public performance.

Prerequisite: Prerequisite(s): MUSC 8A.

MUSC 9 - Wind Ensemble (2)

A study of selected advanced-level works for wind ensemble, culminating in one or more public concerts. Admission by audition with conductor prior to first class meeting.

MUSC 10 - Central Asian Ensemble (2)

Performing ensemble focusing on the vernacular and art musics of the Eurasian continent, with emphasis on Central Asia. (Formerly Eurasian Ensemble.)

MUSC 11A - Introduction to Western Classical Music (5)

A study of significant works of classical music from Gregorian chant to the present day in relation to the historical periods they represent. Emphasizes the listening experience and awareness of musical style and structure. Illustrated lectures and directed listening.

MUSC 11B - Introduction to Jazz (5)

Designed to provide students with thorough and comprehensive background in history and roots of jazz as a musical style from its African roots to the present. Essential jazz styles and traditions are discussed through lectures, required listening, readings, lecture demonstrations, and film presentations.

MUSC 11D - Introduction to World Music (5)

Covers topics reflecting distinctive features of selected world music cultures. Introduces content, scope, and method of ethnomusicology. Focuses on understanding the musical styles, performance practices, and cultural functions of these musical traditions. Incorporates live class performance of selected music.

MUSC 12 - Mariachi Ensemble (2)

Focuses on the stylistic practice of mariachi music of Mexico. Centralizes efforts learning dance music as the son jalisciense, as well as popular singing genres that include the huapango, canción ranchera, corridos, and boleros. Students must have previous experience with music performance and applicable instruments.

MUSC 12B - Mexican Folklorico Music and Dance (2)

Instruction in the aesthetic, cultural, and historical dimensions of Mexican Folklorico dance and music. Brings together a dance ensemble and a music ensemble. Enrollment is by permission of the instructor.

MUSC 13 - Beginning Theory & Musicianship I (5)

Fundamentals of sound production notation in music. Emphasis on the development of the ear and rhythmic skills. Course involves significant participation through in-class performance.

MUSC 14 - Beginning Theory & Musicianship II (5)

Students learn basic elements of musical language: rhythms, meters, scales, intervals, and chords. All of these elements will be studied both singly and in their interrelationships within musical compositions. The study of structural elements of music will incorporate both theoretical and practical aspects of learning, including written, keyboard, singing, and aural exercises. Enrollment is by permission of the instructor.

MUSC 15 - Preparatory Musicianship (5)

Basic studies in musicianship related to Western European notation and literature. Students with prior training in music notation develop literacy in basic tonal melody and harmony. Skills include dictation and sight-reading. Simple composition and analysis exercises accompany the training. Enrollment by placement examination and permission of instructor.

MUSC 16 - Theoretical Foundations of Music (5)

Explores the physics and socio-historical foundations of music so that students are effectively equipped to undertake further culturally informed study in music theory. No prior formal music education is required for this class, though students should have some experience singing or playing an instrument.

MUSC 30A - Theory, Literature, and Musicianship (5)

Integrated musicianship, theory, and analysis. Species counterpoint and fundamentals of tonal harmony. Analysis of literature from the Middle Ages and Renaissance. Ear-training, taught in smaller sections, emphasizes recognition of triad and dominant-seventh inversions, dictation of diatonic melodies, and aural analysis of simple diatonic interval and chord progressions. Most of the ear-training materials consist of homophonic and polyphonic examples from music literature performed live in class. Prerequisite: admission by core curriculum placement examination.

MUSC 30B - Theory, Literature, and Musicianship (5)

Integrated musicianship, theory, and analysis. Diatonic harmony and fundamentals of chromatic harmony and musical form, with an emphasis on early 18th-century styles. Ear-training, taught in smaller sections, emphasizes recognition of triad and seventh-chord qualities and inversions, dictation of moderately complex melodies and multi-voice chorales, and aural analysis of chord progressions including secondary functions. Most of the ear-training materials consist of homophonic and polyphonic examples from music literature performed live in class. Prerequisite(s): MUSC 30A; instructor determination at first class meeting.

MUSC 30C - Theory, Literature, and Musicianship (5)

Integrated musicianship, theory, and analysis. Chromatic harmony and large forms, with emphasis on late 18th- and early 19th-century styles. Ear-training, taught in smaller sections, emphasizes melodic and multi-voice dictation, as well as aural analysis of chord progressions, with materials including digressions, modulations, and advanced chromatic idioms. Most of the ear-training materials consist of homophonic and polyphonic examples from music literature performed live in

class. Prerequisite(s): MUSC 30B; instructor determination at first class meeting.

MUSC 51 - Vocal Repertoire Class (2)

The study and performance of vocal repertoire from 1400 to the present, including solo song, oratorio, opera, ensemble music. Emphasis is given to the development of effective performance skills, culminating in public performance. Attend first class meeting; concurrent enrollment in individual voice lessons with instructor of this course is required.

MUSC 52 - Guitar Repertoire and Performance (2)

Designed to give guitar students who are pursuing the music major and minor, a weekly performance opportunity. Student performers receive feedback and constructive criticism from the instructors and from their peers. The instructors also offer insight and tips on choosing repertoire, performance anxiety and solutions, and historical and cultural context of the composers and music performed in the class. Enrollment by permission of instructor.

MUSC 54 - North Indian Music Workshop (2)

A course covering the music of North India taught using the oral traditions of Indian music. For beginners as well as more experienced students, this course is well suited for instrumentalists and vocalists. Interview; instructor determination at first class meeting.

MUSC 55 - Rhythms of North India (2)

Introduces students to the richness of North Indian rhythms. Includes hands-on exploration of the language of rhythm that is specific to learning the tabla.

MUSC 55A - Intermediate Rhythms of North India (2)

Covers learning to vocalize and play tabla bols. Also works on perfecting the technique of playing the various drum sounds on the tabla, pakhavaj or the dholak. Fundamental rhythmic exercises are focused on learning and improving playing technique and concentrate on compositions, such as a theka, theka prakar, kaida, rela, and tihai. Much of class time is spent on "hands-on" performance interspersed with short instructional bursts to improve each student's level of playability. Lab hours allotted as per student's practice needs.

Prerequisite: Prerequisite(s): MUSC 55, or by permission of instructor.

MUSC 56 - Collaborative Music-Making for Beginners (2)

An active, hands-on introduction to music where no previous musical experience is needed. Using pitched and non-pitched percussion, students are placed into small groups where they create and perform new pieces. Within this framework, students learn about scales, modes, rhythmic structures and form.

MUSC 57 - Survey of Jazz Guitar Styles (2)

Provides a selective historical and technical survey of jazz guitar. In addition to short lectures that provide historical context, students will also learn the basic building blocks of

accompaniment and soloing in a variety of styles. Enrollment by permission of instructor.

MUSC 58 - Songwriting Craft and Practice (5)

Explores the craft of songwriting through listening, analysis, performance, and songwriting assignments. Students are exposed to a variety of writing styles from diverse musical backgrounds such as pop, rock, folk, jazz, avant-garde, classical, and world music. Students gain the ability to analyze a song's form, its textual rhythmic scheme, mood, and performative aspects. Students also compose, record, and perform song samples demonstrating their understanding and creative approach to the concepts discussed in class.

MUSC 59 - Introductory Keyboard Skills (2)

Introductory instruction in piano technique, staff notation, and music theory. Includes group and individual performance experience. A minimum of six hours per week individual practice required. Appropriate for students with little/no piano experience. Students are billed a materials fee. Enrollment is by permission of the instructor. Students audition to determine their skill level.

MUSC 60 - Fundamental Keyboard Skills (2)

Elementary instruction in piano technique, including group and individual performance experience. A minimum of six hours per week of individual practice is required. Curriculum is coordinated with keyboard requirements of MUSC 30A. Concurrent enrollment in MUSC 30A is required. Students are billed a course fee. Prerequisite(s): Instructor determination at first class meeting. (Formerly Group Instruction in Piano.)

MUSC 61 - Individual Lessons: Half Hour (2)

One-half hour of individual instrumental or vocal instruction. Repertory, technique, and performance practice. A minimum of six hours per week of individual practice is required. Concurrent enrollment in an ensemble in the lesson instrument or voice is required. Students are billed a course fee. Admission by audition with the instructor prior to first class meeting. Enrollment priority given to music majors and minors.

MUSC 62 - Individual Lessons: One Hour (3)

One hour of individual instrumental or vocal instruction. Repertory, technique, and performance practice. A minimum of nine hours per week of individual practice is required. Concurrent enrollment in an ensemble in the lesson instrument or voice is required. Students are billed a course fee. Admission by audition with the instructor prior to first class meeting. Enrollment priority given to music majors and minors.

MUSC 63 - Group Instrumental and Vocal Lessons (2)

Elementary group instruction in instrumental (excluding piano) or vocal techniques, including group and individual performance experience. A minimum of six hours per week of individual practice is required. Students are billed a course fee. Admission by audition with the instructor prior to first class meeting.

MUSC 73 - Music and the Ocean (3)

Studio course designed to explore relationships between music, sound, and the ocean. Students learn from a broad selection of music from oceanic and western cultures, deep listening techniques, and scientific research on underwater sound and apply it to their own music making. Students also explore connections between electronic music making and environmental sound research, including an introduction to listening techniques, recording, editing and analysis, composition and installation. Open to performers, composers, and theorists, as well as those from other disciplines, who want to expand their knowledge and practice in an experimental environment. Course ends with an online performance/presentation of new student work.

MUSC 74 - Spontaneous Composition/Improvisation I (5)

Introduction to the basics of jazz improvisation, including theory, harmony, rhythm, improvisation techniques, aesthetics and idiomatic devices. Exposure to jazz repertoire through in-class performances of swing, blues, modal and Latin styles. Admission is by audition with instructor at first class meeting.

MUSC 75 - Jazz Theory I (5)

Studies in the modes, scales, chord alternations and extensions, chord voicings, chord progressions, and forms that underlie jazz improvisation, composition, and arranging in a variety of styles. (Formerly Beginning Improvisational Theory.)

MUSC 77 - Raga Jazz: Application of Indian Music to Western Instruments (5)

North India has some of the most melodic, and rhythmically complex musical forms in the world. Jazz, rock, pop and classical musicians are increasingly studying Indian music to give themselves an edge in today's musical landscape. The purpose of this class is to provide all musicians with a theoretical and practical performance approach using the knowledge of the North Indian music system. The goal is to enhance the melodic and rhythmic sensibilities and to open new doors to boost creativity and give a unique slant to composing and playing music.

MUSC 80A - Music of the Silk Road (5)

Exploration of the commonalities between music cultures found along ancient trade routes through Asia.

MUSC 80B - Music of Asia (5)

Introduces basic concepts of ethnomusicology; instructs students in the development of listening and analytical skills; and explores selected musical areas of East Asia, Southeast Asia, and South Asia.

MUSC 80C - History, Literature, and Technology of Electronic Music (5)

This survey of electronic music from previous centuries to the present studies the works and aesthetics of important composers, acoustics, musical perception, the effects of technological innovation on cultural evolution, and the development of synthesizers and computer music.

MUSC 80E - Race and American Music (5)

Survey of American music and its dynamic formation through cultural constructions of racial difference. Students hear music as contentious signals of identity, power, and transgressions, contextualized by wide-ranging testimony on racial difference, ethnicity, gender, sexuality, and musical practice.

MUSC 80F - Music in Latin American Culture: Regional Traditions (5)

In-depth study of select music cultures of Mexico, Central America, and Caribbean, Brazil, Chile, Argentina, Colombia, and Peru. Characteristic regional genres, ensembles, instruments, and music rituals. Case studies by ethnomusicologists with expertise in specific regional musics. Also Latin American Nueva Canción, women's musics, and overarching themes in Latin American music, as a whole. Offered on a rotational basis with other non-Western courses in the 80 series.

MUSC 80G - American Musical Theater (5)

Surveys American musicals from operetta through rock musicals with a historical approach focusing on selected examples from the literature. Music reading or musical experience helpful but not required.

MUSC 80H - The Hollywood Musical (5)

Introductory study of the Hollywood music film, exploring the theory of film sound, the musical genre, and representative works from the 1920s to the present. Students expected to view about two films each week, read assigned section of texts, and contribute to class discussions.

MUSC 80I - Music of Modern Israel (5)

Historical, musicological, and anthropological study of the many (and often conflicting) worlds brought together by Israeli popular and art music: Jewish and Arabic traditions, Western ideals, and modern beats.

MUSC 80J - American Folk Music (5)

Surveys American folk music, both instrumental and vocal, by region and period. Approach is primarily through listening. Previous musical experience helpful, but not required.

MUSC 80K - Sound in Art, Science, and the Environment (5)

Study the role of sound in artistic creation and scientific research related to the environment. Topics include: environmental sound monitoring, increasing environmental awareness, social activism, discovery of sound phenomena, knowledge of audio tools and techniques, sound and environmental problem-solving.

MUSC 80L - Artificial Intelligence and Music (5)

An introduction to basic concepts in music and artificial intelligence, and to algorithmic composition (composition by a set of explicit instructions, often using the computer). Other topics include basic introductions to related concepts in linguistics, mathematics, neural nets, pattern matching, genetic algorithms, fuzzy logic, and interactive systems. Previous

experience in one or more of these topics is helpful but not required. Students produce a project based on one of the models presented in class.

MUSC 80M - Film Music (5)

A survey of film music including a discussion of current trends and film composers. Techniques and styles of film music are explored through lectures, required listenings, readings, and viewing of relevant films. A musical background, including the ability to read music, is helpful but not necessary.

MUSC 80N - Music of the Grateful Dead (5)

In-depth exploration of the music of the Grateful Dead. Contextual study of the sociology and history of the late 1960s psychedelic movement supplies background for study of the music as the band evolved through time.

MUSC 80O - Music, Politics, and Protest (5)

Examination of relationship between music, politics, and protest in the U.S. in the 20th century, with focus on how music commented upon and reflected different eras in American cultural and political life.

MUSC 80P - Popular Music in the United States (5)

Introduces music and cultural studies, surveys popular music in the United States from 18th-century minstrelsy to 21st-century social media consumer-producers. Emphasizes narratives of race, complicated by ethnicity, gender, and class, informing ways of valuing music, and its capacity for social representation. (Formerly Music 11C, Introduction to American Popular Music.)

MUSC 80Q - A Survey of African Music (5)

Traces the various stylistic musical areas throughout the African continent and explores the development of traditional African music from antiquity into the 20th century.

MUSC 80R - Music in the Digital Age (5)

A survey of how the Internet has influenced how music is made, transmitted, and consumed. Students discuss the history and ethics of file sharing and open source software, telematics and methods of music-making via the Internet, virtual communities, and social media. Students explore these topics through research and creative projects. (Formerly Music and the World Wide Web.)

MUSC 80S - Women in Music (5)

An exploration of the sociological position of women as composers and performers in Western and non-Western musics, with a focus on both ethnographic and historical sources.

MUSC 80T - Mizrach: Jewish Music in the Lands of Islam (5)

A survey of the musical traditions of the Jews of North Africa and the Middle East. Based on the Maqamat, the Arabic musical modes, Jewish music flourished under Islamic rule, encompassing the fields of sacred, popular, and art music.

MUSC 80V - The Music of the Beatles (5)

The most significant group in the history of popular music, the Beatles spanned the gamut of styles from hard-edged R & B to sophisticated art-rock. This course explores their work in detail, in its own terms, and in the historical/cultural/technological contexts. Students cannot receive credit for both this course and MUSC 180V in the same quarter. MUSC 11C is recommended but not required as preparation.

MUSC 80W - Music Business (5)

Explores the many facets of the music industry: history, technology, economics, sociology, and legislation. Provides both a broad understanding of the industry and a pragmatic survey of available career paths. Students cannot receive credit for both this course and MUSC 180W in the same quarter.

MUSC 80X - Music of India (5)

A survey course in Hindustani (North Indian) and Karnatak (South Indian) music covering the Raga (modal system) and Tala (metric system) as they have developed in the two traditions. Consideration is given to the historical development of the music, from Vedic chanting to the modern Raga system; social functions of the music throughout history; and instrumental and vocal forms with an emphasis on listening.

MUSC 80Y - Music, Anti-Semitism, and the Holocaust (5)

The musical legacy of the Holocaust: music and anti-Semitism in the 19th century; morality, collaboration, and composing in the Third Reich; music in the ghettos and concentration camps; impact on post-war music; second-generation composers' trauma; music in Holocaust films.

MUSC 80Z - Laptop Music (5)

Basic digital audio editing and mixing; related concepts in the physics of sound, psychoacoustics, and the digital representation and computer control of audio. Musical notation of musical pulse, meter, and rhythm, and sonic realization via MIDI (musical instrument digital interface). Using their own computers, students complete projects involving recording and spectral analysis, creative editing and mixing of existing recordings, composition of polyphonic drum rhythms, and constructing a collaborative sonic environment.

MUSC 81A - Survey of Rap and Hip Hop Music (5)

Involves examination, evaluation, performance, and discussion of rap music and its relationship to hip hop culture. Looks at three primary areas: historical periods of rap, aspects of performance practice, and lyrical content related to issues in contemporary society. Students engage in listening exercises, performances and presentations, and discuss the placement of rap in an academic setting. No prior musical knowledge is required.

MUSC 81C - Global Popular Music (5)

This cultural study of global popular musics explores musical sounds, practices, and discourse via an examination of the development of the category world music. It explores how music and mass media engage broader issues around

globalization, ethnic, national, and transnational identities; popular resistance; censorship; and cultural hegemony.

MUSC 81E - Music and Resilience in Latin America (5)

Introduces the role of music and musical practices in social movements, cultural changes, and activism in the 20th and 21st centuries in Latin America and Latina/o communities in the United States and other parts of the world where Latin American cultures are vibrant. Case studies covered in class demonstrate how actions occur within social, political, economical, and environmental spheres that impact the formation of identities, the negotiation around human rights, and the well-being of communities.

MUSC 81G - A Cultural History of the Guitar (5)

Surveys the history of the guitar--one of the world's most popular, adaptable, and ubiquitous instruments--by tracing its organological development in the late Renaissance and analyzing representative historical moments of widespread cultural relevance through a technological lens.

MUSC 81H - The Golden Age of Hip Hop (3)

During the Golden Age Era of Hip Hop (late 1980s to mid-1990s) there was a creative explosion of musical representation in rap/hip hop music. Beginning after the commercial success of Run DMC in 1986, class focus continues until the deaths of Tupac Shakur (1996) and the Notorious BIG (1997). In between these points some of the most influential and controversial figures in hip hop history emerge.

MUSC 81I - Music of Indonesia (5)

Explores the wealth of musical culture from throughout the Indonesian archipelago, including islands such as Bali, Java, Sumatra, and Lombok. Students learn about traditional, popular, and contemporary musics from these islands and examine their historical, cultural, and religious interconnections. Major themes include global music theory, cultural identity, religious identity, and cultural exchange. This course also features a lab element in which students have the chance to get hands-on experience learning to play the music of Indonesia using the university's diverse collection of Balinese and Javanese instruments.

MUSC 81J - Jazz Mirror of Global Interconnection (5)

Examines global cultural history through the primary lens of jazz music evolution from its traditional African source through the nexus of the primary elements of sound. Students use music to examine and explore the intersections between many global cultural developments.

MUSC 81M - Chicano/Latino Music in the United States (5)

Examines the process of music making and how it is tied to the notion of space, place, identity and ethnicity, focusing on musical styles, genres, forms, and repertoires in Chicana/o and Latina/o communities in the United States.

MUSC 81P - History of Jewish Music (5)

Survey of the diverse and rich musical traditions of Jewish music in the diaspora from biblical times to the present. Examines the historical, social, and anthropological aspects of the different communities from sacred music through art and popular songs. (Formerly course 80P.)

MUSC 81R - The 1970s: A Decade in Rock (3)

Rock in the 1970s topped music charts while expanding far beyond the radio single. Many 70s artists, such as Elton John, Led Zeppelin, and Pink Floyd, continue to enjoy widespread popularity today. Music 81R engages with key albums and artists from the 1970s and provides students with opportunities to cultivate analytical listening skills and examine this decade in rock, its roots, and its biases. Through weekly discussion assignments culminating in a final album review project, students develop the creative practice of rock music criticism.

MUSC 81S - Music and Science Fiction (3)

Examines the historical and cultural role of music in science fiction literature, film, and television, asking students to question how music is used to convey the strange and unfamiliar and to further think critically about why music is able to do so. Also covers science fiction in opera, symphonic music, and popular music, highlighting the musical elements that comprise the sounds of science fiction.

MUSC 81T - Fundamentals of Music Technology (2)

A practical introduction to the tools and techniques used for live sound reinforcement and studio recording. Hands-on demonstrations of different microphones, speakers, hardware and software processors, analog and digital systems.

MUSC 94 - Group Tutorial (5)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Admission requires approval of department.

MUSC 99 - Tutorial (5)

A program of directed study arranged with a department faculty member. Students submit petition to sponsoring agency.

MUSC 99F - Tutorial (2)

A program of directed study arranged with a department faculty member. Class time is proportionally less than a five-credit course. Students submit petition to sponsoring agency.

Upper-Division**MUSC 101A - History of Western Art Music (Medieval, Renaissance, and Baroque) (5)**

First quarter of a three-quarter chronological study of Western art music. Coordinated lectures, readings, listening, and analysis of representative works: Medieval, Renaissance, Baroque. Formerly History of Western Art Music.

Prerequisite: Prerequisite(s): MUSC 30A and satisfaction of the Entry Level Writing and Composition requirements.

MUSC 101B - History of Western Art Music (5)

Second quarter of a three-quarter chronological study of Western art music. Coordinated lectures, readings, listening, and analysis of representative works: Baroque, Classical, Romantic.

Prerequisite: Prerequisite(s): MUSC 30B and satisfaction of the Entry Level Writing and Composition requirements, or by instructor permission.

MUSC 101C - History of Western Art Music (5)

Third quarter of a three-quarter chronological study of Western art music. Coordinated lectures, readings, listening, and analysis of representative works: Romantic, 20th Century.

Prerequisite: Prerequisite(s): MUSC 30C and satisfaction of the Entry Level Writing and Composition requirements, or by permission of instructor.

MUSC 102 - University Orchestra (2)

A study of selected works for orchestra, culminating in one or more public concerts. Admission by audition with conductor prior to first class meeting. Enrollment restricted to juniors and seniors.

MUSC 103 - University Concert Choir (2)

A study of selected works for orchestra, culminating in one or more public concerts. Prerequisite(s): admission by audition with conductor prior to first class meeting.

MUSC 105A - Music of the United States (5)

Traces major developments in the history of American music since the Revolutionary Era, focusing on what makes music in the United States unique. Material drawn from classical, popular, religious, jazz, and avant-garde traditions.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to music majors, or by permission of the instructor.

MUSC 105C - Folk and Traditional Music in California (5)

A comparative study of the folk and traditional musical productions of five different cultural communities found in California, through a body of media that intersects history, sociology, anthropology, ethnomusicology, and more.

Prerequisite: Prerequisite(s): MUSC 30A and satisfaction of the Entry Level Writing and Composition requirements, or by permission of instructor.

MUSC 105E - Early Keyboard Music (5)

Survey of four centuries of early keyboard music, including representative genres, instruments, composers, and compositions from the late-Gothic to the Classical period. Harpsichord, virginal, organ and fortepiano works studied through scores, recordings, and live performance. Social context, instrument tuning and representative performance practices will coordinate each unit.

Prerequisite: Prerequisite(s): MUSC 101A or MUSC 101B or MUSC 101C. Enrollment is restricted to junior and senior music majors.

MUSC 105I - Improvisation and Collaborative Practices in the 20th Century (5)

Study of music repertoires and performance practices based on improvisation and collaborative approaches to real-time composition in the areas of jazz and other new music.

Prerequisite: Prerequisite(s): MUSC 30A or by permission of instructor.

MUSC 105M - Solo Song: from Monophony to Monody (5)

Traces the changing landscape of the secular solo song from the earliest notated examples of the troubadours through the explosion of monody in print at the beginning of the 17th century.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; and MUSC 30A and MUSC 101A, or by permission of instructor.

MUSC 105O - Opera from Peri to Pergolesi (5)

Traces the development of opera from its origins in the late 16th century through the works of the early 18th century. Explores all aspects of this multimedia genre, with significant research and writing components.

Prerequisite: Prerequisite(s): MUSC 30C and MUSC 101A, or by permission of the instructor.

MUSC 105P - The Piano (5)

Research-based survey of the history of the piano and related keyboard instruments. Topics include instrument mechanics, design, and tuning; important players and innovators in piano technique; repertoire written for piano in classical, jazz, vernacular, and experimental traditions and performance practices, including improvisation; the socioeconomics of the piano industry; the piano's use as a pedagogical tool. Prerequisite(s): MUSC 30A and consent of instructor.

MUSC 105Q - The String Quartet from Haydn to the Present (5)

Traces the development of the string quartet from its origins in the mid-18th Century through the works of the mid-late 20th Century. Emphasis is on listening and analysis with significant research and writing component. (Formerly The String Quartet from Haydn to Shostakovich.)

Prerequisite: Prerequisite(s): MUSC 30A and satisfaction of the Entry Level Writing and Composition requirements, or by permission of instructor.

MUSC 105R - History of Russian Music (5)

Focuses on Russian music in its historical development from the Middle Ages to the 20th century. Class lectures, as well as listening and reading materials, draw together different musical strata. All musical events viewed in their cultural, historical, and social contexts.

Prerequisite: Prerequisite(s): MUSC 30A or by permission of instructor.

MUSC 105T - Tuning and Acoustics Through Monophony, Heterophony, and Polyphony (5)

Explores tuning and acoustics across various cultures throughout music history. Surveying foundational tuning theories developed in ancient Greece, the course follows tuning developments up to the modern era with a focus on how these theories are manifest in the acoustics of instrument building. Categorizations specific to instruments and instrument building (chordophone, aerophone, idiophone, etc.) are outlined in relationship to their historical acoustic and tuning practices. Additionally, the categorizations of monophony, heterophony, and polyphony are applied to the various cultures of music that is surveyed, informing the ensuing considerations pertaining to tuning, acoustics, and instrument building.

Prerequisite: Prerequisite(s): Music 30A, or by permission of instructor.

MUSC 111B - Seminar in Jazz Analysis (5)

Analytic exploration of the evolution of jazz in America. The process involves independent listening, analysis, transcription, weekly seminar discussions, and oral presentation to students in MUSC 111B.

Prerequisite: Prerequisite(s): MUSC 30A and MUSC 11B.

MUSC 120 - Seminar in Music Composition (5)

Instruction in individual composition offered in the context of a group; composition in traditional large and small forms. Counts as one of two choices for a capstone course.

Prerequisite: Prerequisite(s): MUSC 30B or by permission of instructor.

MUSC 121 - Orchestration (5)

A study of the nature of each instrument of the orchestra. Scoring for various small instrumental combinations, culminating in a transcription for full orchestra.

Prerequisite: Prerequisite(s): MUSC 30C.

MUSC 122 - Conducting (2)

The development of basic conducting techniques, including understanding and demonstration of the conductor's posture, best practices of dynamics, left hand usage, mixed meter, and breath.

Prerequisite: Prerequisite(s): MUSC 130 or by permission of the instructor.

MUSC 123 - Electronic Sound Synthesis (5)

Introduction to electronic music studio techniques, relevant electroacoustical studies, and procedures of electronic music composition. Practical experience in the UCSC electronic music studio with an analog synthesizer; mixing, equalization, multitrack recording equipment, and other sound processing. Application form available at department office during last two

weeks of the previous quarter. Preference given to music majors, students in the film/video major, and those with substantial musical experience. Prerequisite(s): instructor determination via application; MUSC 80C or MUSC 30A placement.

MUSC 124 - Intermediate Electronic Sound Synthesis (5)

Composition with the use of small computers in the electronic music studio. Techniques covered include hybrid synthesis, digital synthesis, and MIDI-controlled systems. No programming is involved, but basic computer literacy is helpful.

Prerequisite: Prerequisite(s): MUSC 123.

MUSC 125 - Advanced Electronic Sound Synthesis (5)

Continuing study in the electronic music studio, with concentration on compositional development. Includes advanced applications of skills developed in MUSC 123 and MUSC 124, expansion of background knowledge and relevant electroacoustical studies.

Prerequisite: Prerequisite(s): MUSC 124.

MUSC 129 - Live Electroacoustic Music Ensemble (2)

Explores the live performance practice of electroacoustic music, including historical repertoire, improvisation, and compositions by participants. All manner of electronic audio resources are applied to real-time performance. Participants need a basic proficiency in electronic audio and computer tools. Enrollment is restricted to juniors, seniors, and graduate students. Enrollments is by permission of the instructor at first class meeting.

MUSC 130 - Harmony and Form in 19th-Century and Early 20th-Century Music (5)

Analysis, theory, musicianship, and aural skills associated with advanced tonal music. Study of chromaticism, larger forms, and other features of 19th-Century and early 20th-Century music.

Prerequisite: Prerequisite(s): MUSC 30C and Piano Proficiency Exam.

MUSC 150A - Music Analysis for Performers (5)

A study of homophonic forms in tonal music. Architectonic, thematic, harmonic, and hermeneutic analyses of instrumental and vocal compositions in their historical context. Deliberations of various interpretational solutions and comparative analyses of historical and modern performances.

Prerequisite: Prerequisite(s): MUSC 30C or permission of instructor.

MUSC 150B - Music Analysis and Composition (5)

A course designed to synthesize the analysis and the composition of musical works. Tonal and post-tonal music compositions analyzed, including harmonic, rhythmic, and formal structure analysis. Works discussed include J.S. Bach (and related music by Johannes Brahms, John Adams, Benjamin Britten, Krzysztof Penderecki); Claude Debussy and Bela Bartok; Arnold Schoenberg (and Anton Webern); Olivier

Messiaen (and Karlheinz Stockhausen, Pierre Boulez, Elliot Carter).

Prerequisite: Prerequisite(s): MUSC 120.

MUSC 150C - Special Topics in Music Theory: Tonal Counterpoint (5)

Tonal counterpoint modeled on the music of J.S. Bach. Imitative and non-imitative forms including binary dance, invention, canon, and fugue. Discussion and analytical application of generalized intervallic and harmonic models. Development of related keyboard, singing, and aural skills, including dictation in two and three voices.

Prerequisite: Prerequisite(s): MUSC 130.

MUSC 150D - Special Topics in Theory: Southeast Asia (5)

Explores the relationship between music theory and culture as it introduces students to a range of musical styles throughout Southeast Asia, with a slight focus on the gamelan music of Indonesia. Students also learn about traditional and popular musics from Korea, China, India, and Vietnam, as well as examine the interconnections and relationships between music from different locations. Major themes include global music theory, cultural identity, authenticity, exoticism, fetishism, nationalism, class dynamics, and cultural exchange.

Prerequisite: Prerequisite(s): MUSC 30A, or by permission of instructor.

MUSC 150I - Special Topics in Music Theory: Hindustani Music (5)

In-depth introduction into the music, culture, and theory of Hindustani music.

Prerequisite: Prerequisite(s): MUSC 54 or MUSC 55.

MUSC 150P - Special Topics in Music Theory: 20th-Century Popular Song (5)

Analysis and composition in two 20th-century popular song genres. Part one (of two) is drawn from 1930s swing or Tin-Pan-Alley standards. Part two varies according to instructor and may include genres outside the United States.

Prerequisite: Prerequisite(s): MUSC 30C or permission of instructor.

MUSC 150R - Field Recording: Mapping and Composing Sound, Identity, and Place (5)

This practice-based class explores the art of field recording and the aesthetic, social, political, and ethical questions it engages. Through critical reading, listening, discussion, recording, and creative projects, investigates how sound interacts with nature, urban spaces, objects, people, and networks. Uses sound as our lens in order to gain a stronger appreciation of its presence in our environments and how we create, interpret, and interact with them.

MUSC 150S - Focus on Spontaneous Composition (5)

Examines both music and musical composition, and the characteristics they share with science, mathematics, and the natural world. Written for upper-division and graduate courses, the course text shows that music is part of an interdisciplinary collection of artistic modes of expression, and that these modes can be better understood in the context of what students observe in the real world. Thinking about music, through a variety of angles, students aim to understand that creativity is a vehicle through which to explore the evolution and interconnectedness of music as well as other phenomena in our universe.

Prerequisite: Prerequisite(s): MUSC 30A or by permission of instructor.

MUSC 150T - Post Tonal Analysis (5)

Examines the analytic and compositional techniques associated with selected post tonal styles including the linear, harmonic, rhythmic, and textural elements of music by composers, such as Schoenberg, Stravinsky, Bartok, Debussy, Messiaen, Carter, Cage, and Reich. Students attend weekly keyboard/ear-training laboratories.

Prerequisite: Prerequisite(s): MUSC 130.

MUSC 150X - Theoretical Practices of American Music (5)

Examines theoretical practices and compositional methods of 20th-Century American composers including Charles Ives, Henry Cowell, Ruth Crawford, Johanna Beyer, Harry Partch, Conlon Nancarrow, John Cage, James Tenney, Kenneth Gaburo, George Russell, and Ornette Coleman.

Prerequisite: Prerequisite(s): MUSC 30A, MUSC 30B, and MUSC 30C. Enrollment is restricted to music majors.

MUSC 158 - South African Music Ensemble (2)

Introduces music and performance practice from South Africa. Covers a selection of repertoire in many languages and many traditions, with strong emphasis on vocal music. Enrollment is by permission of the instructor. Students must audition for the class in order to provide information about their skill level.

MUSC 159A - Opera Workshop (2)

A workshop for singers, accompanists, and directors, the course develops a wide variety of skills related to opera through scenework. Attention will be given to movement, acting, coaching, and operatic stage-directing technique. Instruction culminates in studio productions of scenes from operas and musicals. Admission by permission of vocal instructor, or by audition with instructor prior to first class meeting.

MUSC 160 - University Opera Theater (5)

A production workshop, culminating in one or more staged performances of an entire opera or selected scenes from the operatic repertoire. Admission by audition with instructor prior to first class meeting; auditions usually take place in fall quarter.

MUSC 161 - Individual Lessons: One Hour (3)

One hour of individual instrumental or vocal instruction. Repertory, technique, and performance practice. A minimum of nine hours per week of individual practice is required. Concurrent enrollment in an ensemble in the lesson instrument or voice is required. Students are billed a course fee. Admission by audition with the instructor prior to first class meeting. Enrollment priority given to music majors and minors.

MUSC 161A - Individual Lessons: Half Hour (2)

One-half hour of individual instrumental or vocal instruction, intended for upper-division students. Repertory, technique, and performance practice. A minimum of six hours per week of individual practice is required. Concurrent enrollment in an ensemble in the lesson instrument or voice is required. Admission by audition with the instructor prior to first class meeting. Enrollment priority given to music majors and minors.

MUSC 161B - Group Instrumental & Vocal Lessons (2)

Group instruction in instrumental or vocal techniques, including group and individual performance experience. A minimum of six hours per week of individual practice is required. Intended for upper-division students. Admission by audition with the instructor prior to first class meeting.

MUSC 162 - Advanced Individual Lessons: One Hour (5)

One hour of individual instruction for advanced students. Study of repertory, technique, and performance practice. A minimum of 18 hours per week of individual practice and at least one 30-minute recital are required. May be taken three times for credit. Concurrent enrollment in an ensemble in the lesson instrument or voice is required. Students are billed a course fee. Admission by juried audition.

MUSC 163 - Early Music Ensemble (2)

A study of selected works for varied early music instrumental and vocal resources, culminating in one or more public concerts. Individual lessons are recommended in conjunction with consort work. Recommended for students who have instrumental or vocal competence and music literacy. Admission by audition with instructor prior to first class meeting.

MUSC 164 - Jazz Ensembles (2)

Instruction in combo performance and techniques of the jazz idiom. The class forms several ensembles that prepare a specific repertory for public performance. Admission by audition with instructor prior to first class meeting.

MUSC 165 - Chamber Music Workshop (2)

A study of selected works for various small combinations of instruments, culminating in one or more public concerts. Admission by audition with instructor prior to first class meeting.

MUSC 166 - Chamber Singers (2)

The study of selected works for small vocal ensemble from the 15th through 20th centuries, with performances on and off

campus throughout the academic year. Students must have demonstrated vocal and music reading skills. Admission by audition with instructor prior to first class meeting.

MUSC 167 - Workshop in Electronic Music (2)

Continuing studio work in electronic music. Students carry out individual projects, meeting in weekly seminar to share problems and discoveries. Relevant advanced topics are covered, including new developments in the art.

Prerequisite: Prerequisite(s): MUSC 124.

MUSC 167R - Recording Workshop (2)

Seminar in modern studio recording. Students learn aspects of recording from pre-production through mastering and distribution. Weekly recording sessions give students hands-on experience in running recording sessions and working with musicians. Admission by interview with instructor prior to first class meeting. Enrollment is restricted to music majors.

MUSC 168 - Experimental Music Ensemble (2)

A study of selected works for various small combinations of instruments and voice, culminating in one or more public concerts. Admission by audition with instructor. Contact instructor prior to first class meeting.

MUSC 174 - Intermediate Spontaneous Composition and Improvisation (5)

Through performance, composition, analysis, and transcription course gives students an opportunity to expand and enrich their skills in applying musical knowledge to the application of spontaneous composition over a range of jazz styles, including older standards and more contemporary tunes. (Formerly Intermediate Jazz Improvisation.)

Prerequisite: Prerequisite(s): MUSC 74 or MUSC 75 or two quarters of MUSC 3.

MUSC 175 - Jazz Theory II (5)

Through transcription, analysis, and performance of jazz standards, composition, arranging, improvisation, and spontaneous creation explored. Students write a series of improvisations, short compositions, and arrangements throughout the course.

Prerequisite: Prerequisites: MUSC 74 or MUSC 75 or two quarters of MUSC 3.

MUSC 180A - Studies in World Musics: Asia and the Pacific (5)

In-depth ethnomusicological studies of selected music cultures of East Asia, Southeast Asia, and the Pacific. Emphasizes comparison of historical, theoretical, contextual, and cultural features. Includes basic ethnomusicological points of reference, as regards organology, music ritual, notation and transcription, and aspects of field research.

Prerequisite: Prerequisite(s): Enrollment is restricted to music majors and music graduate students. Students may also enroll with permission of instructor.

MUSC 180B - Studies in World Musics: Africa and the Americas (5)

In-depth ethnomusicological studies of selected music cultures of sub-Saharan Africa and South and North America, including Native America. Emphasizes comparison of historical, theoretical, contextual, and cultural features. Includes basic ethnomusicological points of reference, as regards organology, music ritual, notation and transcription, and aspects of field research.

Prerequisite: Prerequisite(s): MUSC 30B; concurrent enrollment in a non-Western performing ensemble is strongly recommended. Enrollment is restricted to music majors and graduate students. Anthropology majors may enroll with permission of instructor.

MUSC 180C - Studies in World Musics: Central Asia (5)

In-depth, ethnomusicologically oriented course on select music cultures in Central Asia. Compares theoretical, historical, and cultural aspects of music and culture from Uzbekistan, Tajikistan, Afghanistan, Kyrgyzstan, Kazakhstan, the Xinjiang region of China, Mongolia, and Tuva.

Prerequisite: Prerequisite(s): Enrollment is restricted to music majors and music graduate students. Students may also enroll with permission of instructor.

MUSC 180D - Music of Insular Southeast Asia (5)

Comparative studies of selected music cultures focusing on the cosmology, music rituals, and organology of varied cultures in Malaysia, Indonesia, Papua New Guinea, and the Philippines. Introduction to ethnomusicology field research and transcription, and hands-on ensemble workshops.

Prerequisite: Prerequisite(s): MUSC 30A; concurrent enrollment in MUSC 5B, MUSC 5C, or MUSC 8. Enrollment is restricted to music majors. Anthropology majors may enroll with permission of instructor.

MUSC 192 - Directed Student Teaching (5)

Teaching of a lower-division seminar under faculty supervision. (See course 42.) Upper-division standing and a proposal supported by a music faculty member willing to supervise required.

MUSC 195A - Senior Thesis (5)

Preparation of senior thesis over one or two quarters. If taken as a multiple-term course, the grade and evaluation submitted for the final quarter applies to the previous quarter. Students submit petition to sponsoring agency.

MUSC 195B - Senior Thesis (5)

Preparation of senior thesis over one or two quarters. If taken as a multiple-term course, the grade and evaluation submitted for the final quarter applies to the previous quarter. Students submit petition to sponsoring agency.

MUSC 196A - Senior Recital Preparation (without individual

lessons) (5)

Prerequisite(s): juried audition or approved composition portfolio. Students submit petition to sponsoring agency.

MUSC 196B - Senior Recital Preparation (with individual lessons) (5)

Students are billed a course fee. Prerequisite(s): juried audition.

MUSC 199 - Tutorial (5)

A program of directed study arranged with a department faculty member. Students submit petition to sponsoring agency.

MUSC 199F - Tutorial (2)

A program of directed study arranged with a department faculty member. Class time is proportionally less than a five-credit course. Students submit petition to sponsoring agency.

Graduate

MUSC 200 - Introduction to Research Methods (5)

Practical introduction to graduate study in music focusing on research methods, music sources and bibliography, techniques of scholarly writing, and critical readings in the discipline. Culminates in a public oral presentation on the model of a professional conference paper.

MUSC 201 - History of Music Theory from the Greeks Through Rameau (5)

Study and analysis of pre-tonal and tonal music from the Greeks through the 18th century. Course combines a history of theory with analyses that utilize contemporaneous theoretical concepts.

Prerequisite: Enrollment is restricted to graduate students.

MUSC 202 - Tonal and Posttonal Analysis (5)

Encompasses various forms of linear analysis, set theory, and selected topics in current analytical practice.

MUSC 203A - Performance Practice in the Middle Ages (5)

A study of performance practices in medieval music from Gregorian chant to the 14th century. History of instruments and notation. Rhythmic interpretations of chant and a study of improvised practices in organum. Editing and performance of representative works. Offered on a rotational basis with other courses in the 203 series.

MUSC 203B - Performance Practice in the Renaissance (5)

A study of performance practices in Renaissance music, including concepts of mode, *musica ficta*, ornamentation, text underlay, tempo, and articulation. Basic principles of white notation and a brief history of instruments. Transcription, editing, and performance of a Renaissance work. Offered on a rotational basis with other courses in the 203 series.

MUSC 203C - Performance Practice in the Baroque (5)

An examination of historically informed performance practice techniques in Baroque music, with attention to aspects of ornamentation, articulation, figured bass realization, dance choreography, rhythm and tempo, and organology. In-class performances and editing of source materials are included. Offered on a rotational basis with other courses in the 203 series.

MUSC 203D - Performance Practice in the Classic Period (5)

Issues in performance practice focusing on selected topics and styles from the time of C.P.E. Bach through Haydn. Development of selected genres and ensembles, sources and editing, and interpretation and improvisation. Offered on a rotational basis with other courses in the 203 series.

MUSC 203E - Performance Practice in the Romantic Period (5)

Interpretation of music from Beethoven to Scriabin through examinations of both the musical texts (form, genre, harmony, texture, orchestration, etc.) and the period performance practices. Topics range from interpretative analyses of selected compositions to critical assessments of modern as well as documented 19th- and early 20th-century performances. Offered on a rotational basis with other courses in the 203 series.

MUSC 203F - Performance Practice in the 20th Century (5)

Projects in analysis, notational studies, extended instrumental techniques, and the aesthetics and performance practices associated with composers from Debussy to the present. Reading and listening focuses on the writings and performances of the composers themselves and upon interpretive writings by informed performers of 20th-century music. Offered on a rotational basis with other courses in the 203 series.

MUSC 203G - Concepts, Issues, and the Practice of Ethnomusicology (5)

Ethnomusicological field methodology; vocal and instrumental performance practices as related to the ethnomusicological endeavor. Specific topics: philosophical paradigms, historical overview, and definitional issues of ethnomusicology; field research concepts and procedures; studies in instrumental and vocal performance practices of diverse cultures; selected writings of Charles Seeger; transcription and analysis issues; studies in micromusics. Offered on a rotational basis with other courses in the 203 series.

MUSC 203H - Area Studies in Performance Practice (5)

Intensive examination of the vocal and instrumental performance practices of living musical traditions of Indonesia, Latin America, or other regions. Topics may incorporate soloistic and ensemble traditions, secular and sacred traditions. Research rubrics include tuning, tone quality, performance posture and rhetoric, and improvisational and fixed patterns, as dictated by regional norms. May be repeated for credit in a different area. Offered on a rotational basis with other courses in the 203 series.

MUSC 204 - Pedagogy of Music (2)

Provides graduate students with an opportunity to reflect on and practice a wide variety of pedagogical skills necessary to teach post-secondary music in a number of settings, including rehearsals, lectures, sections, and labs. These skills may include lesson planning, inclusive teaching, active learning, assessment, evaluation, teaching with technology, syllabus design, teaching statement writing, and lesson facilitation. Pedagogical skills modeled through a series of facilitated activities.

Prerequisite: Enrollment is restricted to graduate students.

MUSC 204W - Graduate Writing Workshop (2)

Focuses on the mechanics of academic writing (including grammar and syntax) with a focus on styles specific to writing about music. Topics covered will include writing music criticism, developing ethnographic descriptions of musical events (i.e., "thick description"), crafting written descriptions of musical sound, and academic writing for general audiences. Students also utilize the workshop to develop large-scale writing projects specific to their course of study (such as preparatory qualifying exam essays, composition program notes, dissertation and thesis chapters, conference papers, etc.).

Prerequisite: Enrollment is restricted to graduate students.

MUSC 205A - Conceptual Foundations in Western Music Analysis (2)

Focused analysis of selected works from the Western classical music repertoire, Emphasis is on aural and analytical skills, the modal and tonal foundations of Western music, and the evolution of form and expression.

Prerequisite: Enrollment is restricted to graduate students.

MUSC 205B - Conceptual Foundations in World Music (2)

A broad survey of traditional and vernacular musical practices from around the world with an emphasis on aural analysis and critical listening skills.

Prerequisite: Enrollment is restricted to graduate students.

MUSC 206A - World Music Composition (5)

Studies in the history, structure, and cultural function of music from cultures as diverse as Global African, central European, Korean, Latin American, Indonesian, and Indian traditions. Examines ways in which composers such as Bartok, Anthony Braxton, Chou Wen-Chung, Lou Harrison, and Takemitsu sought and integrated such influences. Students choose to write critical and analytic essays on musics exhibiting diverse cultural influences, or to compose music that takes a vernacular or non-European music as a model for a compositional/improvisational approach.

Prerequisite: Enrollment is restricted to graduate students.

MUSC 206B - Computer-Assisted Composition (5)

Study of techniques of algorithmic and computer-assisted composition in a variety of contemporary idioms. Topics may include stochastic methods, generative grammars, search

strategies, and the construction of abstract compositional designs and spaces. Final project for course involves students formulating and algorithmically implementing their own theoretical assumptions and compositional strategies.

Prerequisite: Enrollment is restricted to graduate students.

MUSC 206D - Music Perception and Cognition (5)

Investigations in the psychology of musical listening and awareness. Topics include time and rhythm perception, auditory scene analysis, pattern recognition, and theories of linguistics applied to harmony, melody, and form in the music of diverse cultures. Explores applications of the cognitive sciences to music transcription, analysis, composition, interpretation, and performance practice. Students apply existing knowledge in the cognitive sciences to a developing creative or analytical project, or develop and conduct new experiments.

Prerequisite: Enrollment is restricted to graduate students.

MUSC 206I - Negotiating the Musical Work (5)

Explores the ontology of music and relevant topics. Weekly readings in addition to guest speaker(s) and workshops. Everyone is expected to read and digest as much as possible ALL of the assigned readings.

Prerequisite: Enrollment is restricted to graduate students.

MUSC 219 - Techniques in Composition (5)

Short compositional exercises incorporating diverse contemporary techniques with emphasis on problem solving and development of compositional skills. Exercises focus on particular strategies for organizing and coordinating aspects of pitch, rhythm, timbre, and other musical dimensions, depending on interests of instructor and students.

Prerequisite: Enrollment is restricted to graduate students.

MUSC 220 - Graduate Seminar in Music Composition (5)

Instruction in individual composition offered in the context of a group; composition in large forms of the 20th century with emphasis on techniques since 1950. May be taken by upper-division undergraduates for credit. Interview with instructor at first class meeting.

Prerequisite: Prerequisite(s): MUSC 219.

MUSC 228 - Techniques of Modernity and Aesthetic Formations (5)

Explores the transformations and aesthetic possibilities of the digital age through a study of perceptual shifts of the past, from orality to literacy, gift to commodity, pre-colonial to colonial, pre-modern to modern, and the technological revolutions that accompanied these shifts.

Prerequisite: Enrollment is restricted to graduate students; upper-division undergraduates may enroll with permission of instructor.

MUSC 252 - Current Issues Colloquium (0)

An interactive colloquium featuring presentations by faculty, graduate students, and visiting scholars on research projects in composition, musicology / ethnomusicology, and performance practice, followed by focused discussion.

Prerequisite: Enrollment is restricted to graduate students. Undergraduate students may enroll with permission of instructor.

MUSC 253A - Historical Perspectives in Musicology and Ethnomusicology (5)

Explores trends in musical scholarship in the 20th and 21st centuries, focusing on broad questions and modes of inquiry within historical musicology and ethnomusicology.

Prerequisite: Enrollment is restricted to graduate students.

MUSC 253B - Rhythm, Time, and Form (5)

Traditional and experimental rhythmic and temporal systems representing diverse cultures, with emphasis on unmeasured, divisive, additive, and multilayer practices in cultural context. Students examine rhythmic composition, improvisation, and rubato performance in selected cultures, including rhythmic notation and transcription systems.

Prerequisite: Prerequisite(s): MUSC 200 or the equivalent, or consent of instructor. Enrollment is restricted to graduate students.

MUSC 253C - Music and Discourse (5)

Addresses both song and musical performance as modes of discourse. For song: musical and textual phrase and verse structures and their interrelationships. For musical performances: musical performance as rhetoric and emblem.

Prerequisite: Enrollment is restricted to graduate students.

MUSC 253D - Issues in the Ethnography of Music (5)

Explores ethnography—the description of culture—as it relates to musicology and ethnomusicology, particularly where culture and cultural production are historically dynamic and geographically porous. Examines music with sensitivity to such complexities of context, and the disciplinary points of reference from which cultural difference is calculated. Considers the ideological imprint of methodology on cultural analysis: how to study an unfamiliar music in a way that transcends the measure of difference from the familiar, and, conversely, how to conduct an objective study of a familiar music.

Prerequisite: Enrollment is restricted to graduate students.

MUSC 254C - Performativity and Music (5)

Performance can describe activities in the arts, humanities, and social sciences. Recognizing the mappings of this concept, this course examines selected performances and performative behavior through theoretical and critical lenses. Emphasis is on investigating the act and practice of musical performance in multicultural context, and on analyzing scholarly writing as performative discourse.

Prerequisite: Enrollment is restricted to graduate students.

MUSC 254D - Organology and Acoustics (5)

Comprehensive study of musical instruments including, but not limited to, physical and engineering concepts; theory and methods of description, analysis, systematic, and cultural classifications; physiology and performance techniques; cultural significance; anthropomorphic and zoomorphic symbolism; ritual usage; and more. Previous enrollment in introductory ethnomusicology course (e.g., MUSC 11D) helpful, but not required. Enrollment by interview only, except music M.A. and Ph.D. students. Enrollment restricted to junior and senior music majors, electronic music minors, anthropology majors, or physics majors, and graduate students.

MUSC 254E - Asian Resonances in 20th-Century American and European Music (5)

Explores the influence of Asian musics on Western composers from Debussy to Britten to American experimentalists such as Harrison, Cage, Riley, and Rudyard. Questions of cultural appropriation and originality are addressed through specific examples and critical readings.

Prerequisite: Enrollment is restricted to graduate students.

MUSC 254F - Beethoven (5)

Examines the life and work of composer Ludwig van Beethoven (1770-1827). In addition to a close study of his biography and musical compositions, course considers the role of historiography and reception history in the development of his "heroic" status and Romantic cultivation of the "cult of genius." Also critically examines issues having to do with canon construction, positivist research vs. "new musicology," and how Beethoven has been used for political purposes and in popular culture.

Prerequisite: Enrollment is restricted to graduate students.

MUSC 254J - Jazz Historiography (5)

Introduces the ways jazz history has been conceptualized, evaluated, and transmitted. Examines the social, intellectual, and cultural formations that have influenced this historiography. Considers the interdisciplinary project of new jazz studies in relation to established and alternative historical narratives.

Prerequisite: Enrollment is restricted to graduate students.

MUSC 254K - Music, Gender, and Sexuality (5)

Seminar focuses on musicological and ethnomusicological work incorporating feminist and queer theories published since the late 1980s. Cross-cultural approach to the examination of music, gender, and sexuality, drawing examples from both Western and non-Western traditions.

Prerequisite: Enrollment is restricted to graduate students.

MUSC 254L - John Cage: Innovation, Collaboration, and Performance Technologies (5)

In-depth examination of John Cage's interdisciplinary work, his pioneering activity in live electronic technology, and his

influence in current multimedia creativity. Approximately one-half of the seminary is devoted to student research and creative projects and reflect Cage's legacy.

Prerequisite: Enrollment is restricted to juniors, seniors, and graduate students. Upper-division undergraduates may enroll with permission of instructor.

MUSC 254M - Music in San Francisco, 1850-1950 (5)

Explores San Francisco's musical life during the city's first century, including opera, symphony, Chinese music, musical theater, and other genres. Considerable emphasis on music and society, including issues of race.

Prerequisite: Enrollment is restricted to graduate students.

MUSC 254N - Cruising the Postcolony (5)

Drawing on Jose Esteban Munoz's suggestion that queer politics is most radical when it is looking to the possibilities of the future rather than the pragmatics of the present, this course interrogates the radical vision of postcolonial and queer music-making.

Prerequisite: Enrollment is restricted to graduate students.

MUSC 254O - Historiography of American Music (5)

Covers the period in United States history between the Revolutionary Era and the Civil War (approximately 1770-1865). Examines historical and contemporary writings about music in the United States, its composers, musicians, musical institutions, economics, and performance practices.

Prerequisite: Prerequisite(s): MUSC 200 or equivalent. Enrollment is restricted to graduate students.

MUSC 254R - Research Design and Grant Writing for Music Scholars (5)

Dissertation research grant applications and their attenuating dissertation proposals represent the first time most graduate students think through the theoretical issues and strategic planning of a major project and convince others within and outside their field of its academic validity. This seminar (primarily for Ph.D. and D.M.A. students in their 2nd, 3rd, or 4th year who are applying for grants to support doctoral research) provides guidance on topics about dissertation research, professional development, and grant applications.

Prerequisite: Enrollment is restricted to graduate students.

MUSC 261 - Graduate Applied Instruction (3)

One hour of individual instrumental or vocal instruction for graduate students. Repertory, technique, and performance practice. A minimum of nine hours per week of individual practice is required. Students are billed a course fee. Admission by audition with the instructor prior to first class meeting.

MUSC 265 - Graduate Ensemble Participation (2)

Participation by graduate students in ensembles. Enrollment limit appropriate to the size of each ensemble. Admission by audition with the instructor prior to first class meeting.

MUSC 267 - Workshop in Computer Music and Visualization (2)

Graduate-level techniques and procedures of computer music composition and visualization. Practical experience in the UCSC electronic music studio with computer composition systems and software, including visualization and interactive performance systems. Extensive exploration of music and interactive graphic programs such as Max/MSP/Jitter. Enrollment is by permission of instructor; appropriate graduate experience required. Enrollment is restricted to graduate students.

MUSC 295 - Directed Reading (5)

Directed reading, which does not involve a term paper. May be repeated once for credit. Students submit petition to sponsoring agency.

MUSC 297 - Independent Study (5)

Independent study, creative work, or research for graduate students who have not yet begun work on their thesis. Students submit petition to sponsoring agency.

MUSC 297F - Independent Study (2)

Independent study or research for graduate students. Students submit petition to sponsoring agency.

MUSC 298 - Graduate Recital (5)

A public performance in the student's primary area of interest, related to the thesis or dissertation project, under the supervision of a faculty member. Students submit petition to sponsoring agency.

Prerequisite: Enrollment is restricted to graduate students.

MUSC 299 - Thesis Research (5)

A thesis consisting of a substantive and original creative or scholarly work, related to the graduate recital, under the supervision of a faculty member. Students submit petition to sponsoring agency.

NLP-NATURAL LANGUAGE PROCESSING

Graduate

NLP 201 - Natural Language Processing I (5)

The first course in a series covering the core concepts and algorithms for the theory and practice of natural language processing (NLP), the creation of computer programs that can understand, generate, and learn natural language.

Prerequisite: Enrollment is restricted to natural language processing graduate students, and computer science and engineering doctoral students by permission of instructor.

NLP 202 - Natural Language Processing II (5)

This is the second course in a series covering the core concepts and algorithms for the theory and practice of natural language

processing (NLP)—the creation of computer programs that can understand, generate, and learn natural language.

Prerequisite: Prerequisite(s): NLP 201. Enrollment is restricted to natural language processing graduate students.

NLP 203 - Natural Language Processing III (5)

Third and final course in a series covering the core concepts and algorithms for the theory and practice of natural language processing (NLP)—the creation of computer programs that can understand, generate, and learn natural language.

Prerequisite: Prerequisite(s): NLP 201 and NLP 202.

NLP 220 - Data Collection, Wrangling and Crowdsourcing (5)

Covers a broad set of tools and core skills required for working with Natural Language Data. It covers methods for collecting, merging, cleaning, structuring and analyzing the properties of large and heterogeneous datasets of natural language, in order to address questions and support applications relying on those data. Also covers both working with existing corpora as well as the challenges in collecting new corpora.

Prerequisite: Enrollment is restricted to natural language processing graduate students. .

NLP 243 - Machine Learning for Natural Language Processing (5)

Introduction to machine learning models and algorithms for natural language processing (NLP) including deep learning approaches. Targeted at professional master's degree students, course focuses on applications and current use of these methods in industry. Topics include: an introduction to standard neural network learning methods such as feed-forward neural networks; recurrent neural networks; convolutional neural networks; and encoder-decoder models with applications to natural language processing problems such as utterance classification and sequence tagging.

Prerequisite: Enrollment is restricted to natural language processing graduate students.

NLP 244 - Advanced Machine Learning for Natural Language Processing (5)

Introduces advanced machine learning models and algorithms for Natural Language Processing. Theoretical and intuitive understanding of NLP learning models will be discussed. Some hot topics such as robustness and explainability in ML for NLP will also be covered. The course assumes that students have taken NLP 243, graduate level machine learning.

Prerequisite: Prerequisite(s): NLP 243. Enrollment is restricted to natural language processing graduate students and computer science and engineering doctoral students, or by permission of instructor.

NLP 245 - Conversational Agents (5)

Reviews recent work on conversational AI systems for task-oriented, informational, and social conversations with machines. Students read and review theoretical and technical papers from journals and conference proceedings, lectures and

engage in discussions. The course assumes that NLP 243, NLP 201 and NLP 202 or equivalent have already been completed. A research project is required.

Prerequisite: Prerequisite(s): NLP 243, or CSE 242, or CSE 243. Enrollment is restricted to natural language processing graduate students and computer science and engineering doctoral students, or by permission of instructor.

NLP 255 - Topics in Applied Natural Language Processing (5)

Gives students a solid foundation in a specific application area of natural language processing, by learning about the theories, methods, tools, and techniques typically used in this area. The application area varies each quarter, with expected topics to include Information Extraction, Question Answering, Natural Language Generation, Sentiment Analysis, and others. Students learn about the state of the art and open challenges, and have the opportunity to explore and experiment with both standard algorithms and new emerging approaches.

Prerequisite: Prerequisite(s): NLP 243 or NLP 201 or CSE 242 or CSE 243 or CSE 245. Enrollment is restricted to natural language processing graduate students and computer science and engineering Ph.D. students, or by permission of the instructor.

NLP 267 - Machine Translation (5)

Machine Translation systems can instantly translate between any pair of over eighty human languages such as German to English or French to Russian. Modern translation systems learn to translate by reading millions of words of already translated text. This course covers the models and algorithms used by such systems and explains how they are able to automatically translate one human language to another. The course covers fundamental building blocks using concepts from linguistics, statistical and deep machine learning, algorithms, and data structures. It provides insight into the challenges associated with machine translation and introduces novel approaches that might lead to better machine translation systems.

Prerequisite: Prerequisite(s): NLP 201; and NLP 243 or CSE 244. Previous or concurrent enrollment in NLP 202. Enrollment is restricted to natural language processing graduate students and computer science and engineering Ph.D. students, or by permission of instructor.

NLP 270 - Linguistic Models of Syntax and Semantics for Computer Scientists (5)

Provides an introduction to theoretical linguistics for natural language processing, focusing on morphology, syntax, semantics, and pragmatics, and on training students in linguistic description, representation, and argumentation. Students learn to describe common features underlying natural languages and to manipulate several syntactic and semantic representations.

Prerequisite: Enrollment is restricted to natural language processing graduate students and computer science and engineering Ph.D. students, or by permission of instructor.

NLP 271A - Capstone I: Natural Language Processing (3)

The first in a sequence of three capstone courses providing hands-on practice of key NLP concepts and skills and experience working in a team project setting. Provides students with tools for project management and working in a team. Explores multiple possible projects, and methods for presenting projects, and investigates what makes a good project proposal, and how to evaluate and understand the strengths and weaknesses of project proposals.

Prerequisite: Prerequisite(s): NLP 201 and NLP 220.
Enrollment is restricted to natural language processing graduate students.

NLP 271B - Capstone II: Natural Language Processing (5)

The second in a sequence of three capstone courses providing hands-on practice of key NLP concepts and skills and experience working in a team project setting. Provides students with tools for project management and working in a team. The course allows students to refine and further define several possible projects, present them for feedback, produce initial implementations of key modules and assess them, culminating in the writing and presentation of a detailed final project proposal along with its initial implementation.

Prerequisite: Prerequisite(s): NLP 202 and NLP 271A.
Enrollment is restricted to natural language processing graduate students.

NLP 271C - Capstone III: Natural Language Processing (5)

The third in a sequence of three capstone courses providing hands-on practice of key natural language processing concepts and skills and experience working in a team project setting. This course provides students with tools for project management and working in a team. Focuses on completing the capstone project, by working together as a team, implementing the project in phases, testing and assessing the quality of the final implementation, writing the final project report, and oral presentation of the team project.

Prerequisite: Prerequisite(s): NLP 203 and NLP 271B.
Enrollment is restricted to natural language processing graduate students.

NLP 280 - Seminar in Natural Language Processing (2)

Weekly seminar course covering current research and advanced development in all areas of Natural Language Processing. The seminar is based on invited talks by guest speakers from industry research and advanced development working in the area of Natural Language Processing. Students attend talks given by speakers in a weekly seminar series and participate in discussions after the talks. This class can be taken for Satisfactory/Unsatisfactory credit only.

Prerequisite: Enrollment is restricted to natural language processing graduate students and computer science and engineering doctoral students. Others may enroll by permission of instructor.

OAKS - OAKES COLLEGE**Lower-Division****OAKS 1 - Academic Literacy and Ethos: Communicating Diversity for a Just Society (5)**

Teaches foundational concepts for intellectual exploration and personal development within an academic community: analysis, critical thinking, metacognition, engagement with others across difference, and self-efficacy. The Oakes core course considers the intersections between reading, personal and social identities, and social justice.

Prerequisite: Enrollment is restricted to first-year college members.

OAKS 1A - Introduction to University Life and Learning (1)

Orientation to and exploration of the nature of the liberal arts, and of learning at research universities. Topics include: academic planning for upper-division coursework; enrollment processes; and understanding pathways to degree completion; UCSC resources that support health and well-being strategies for academic success; the cultivation of just communities; the prevention of sexual harassment and violence; campus conduct policies; awareness of risks associated with drug and/or alcohol use; and an introduction to traditions of community-engaged learning, ground-breaking research, and interdisciplinary thinking that define a UC Santa Cruz degree. This course can be taken for Pass/No Pass grading only.

Prerequisite: Enrollment is restricted to entering first-year Oakes College students.

OAKS 3L - Precalculus Academy Lab (2)

Students use worksheets designed to help them solve problems by thinking critically, and participate in answering project-based questions relevant to the themes of their college core courses. Prerequisite(s): Mathematics 2 or placement (MP) score of 200 or higher. Concurrent enrollment in Mathematics 3 is required. Enrollment is by permission of the instructor.

OAKS 10 - Academic Success (2)

Provides opportunity to assess and revise methods of and purposes in studying. Critical, effective approaches to reading, writing, participating in lectures and sections, taking exams, balancing competing responsibilities, and utilizing campus resources explored. Enrollment by permission of college adviser.

OAKS 11 - Foundation of Leadership (3)

Teaches leadership skills to create effective teams, and motivates individuals to communicate effectively with teammates with different styles. Enrollment is restricted to first-year and sophomore college members and by permission of instructor.

OAKS 26 - Navigating the University From a Black Critical Lens

(2)

Explores critical engagement in education within the U.S. research university context. Introduces sociohistorical perspectives on how new students (fresh and transfer) can navigate the opportunities and challenges of the institution's academic life from a critical race and decolonial theoretical lens. Provides strategies to define goals, develop an action-oriented plan toward academic, career, and civic-oriented outcomes, and examine and build students' own social and cultural capital.

OAKS 30 - Thesis Writing and Editing (2)

Substantial writing and revision for a piece of writing relevant to a student's field. Focuses on academic research, documentation, editing, and revision. Enrollment restricted to junior and senior college members. Enrollment by permission of instructor.

OAKS 46 - Multiracial Visibility Project (5)

The purpose of the class is to bring visibility to multiracial and multicultural populations on college campuses. Students explore readings and other course content to understand the experiences of multiracial people. They explore different ways to advocate for multiracial people who may not have space or a voice in research or in popular cultural outlets (e.g., mainstream media). The goal is to raise awareness of multiracial people by elevating multiracial students' voices and experiences.

Prerequisite: Enrollment is restricted to Oakes College affiliates.

OAKS 47 - Building an Inner Sanctuary (2)

Through experiential methodologies of self-leadership and mind-body practices, this course encourages students to discover and flex those internal resources which enhance resilience, foster psycho-emotional and community-building skills, and affirm their cultural dignity. Enrollment is by application and permission of the instructor.

OAKS 48 - Slugs Speak: Our Stories, Our Selves (2)

Students learn about the power of story to make change through this Storytelling for Justice project. Students practice developing personal life stories, learn to create and facilitate community space, and participate in a community storytelling event focused on intersectional identities.

Prerequisite: Enrollment is restricted to Oakes College affiliates or by instructor permission.

OAKS 60 - Oakes Literary Journal: Further Reflections on a Diverse Society (2)

For publication in an Oakes College literary journal, students significantly refine an essay from the fall quarter Oakes College core course. Course work includes consideration of a substantive text that engages core course themes and promotes the focus of the essay.

Prerequisite: Prerequisite(s): OAKS 80A or OAKS 80B. Enrollment is restricted to first-year students.

OAKS 67 - The Politics of Food: Labor and Social Justice (2)

Engages the themes of Oakes College (respect for diversity and social justice) and the interests of UCSC's Center for Agroecology and Sustainable Food Systems. Topics include the racial politics of food, farm labor, organic farming, and activism.

Prerequisite: Prerequisite(s): successful completion of OAKS 80A, OAKS 80B, OAKS 80C, OAKS 80D, or OAKS 80H. Enrollment is restricted to college members.

OAKS 70 - Diverse Voices in Contemporary American Women's Poetry (2)

Students examine issues in the work of contemporary American women poets representing a range of cultural, sexual, socioeconomic, and ideological identities. Discussion focuses on theories of poetics as well as poetry analysis and interpretation within the context of social and cultural identity. Students create a portfolio of their own poetry in response to weekly prompts.

Prerequisite: Enrollment restricted to Oakes College members.

OAKS 72 - Building the Strength to Love and Dream: Oakes Oral History Project (5)

Students study the founding and development of Oakes College through oral history. Students immerse themselves in thorough background research and build skills necessary to conduct oral histories with previous Oakes affiliates, revising pieces suitable for publication.

Prerequisite: Prerequisite(s): satisfaction of Entry Level Writing and Composition requirements. Enrollment is restricted to College members; other students may contact the instructor for a permission code.

OAKS 73B - Oakes College Mentoring: Service Learning Practicum (2)

Mentors introduce first-year students to campus resources, provide them with academic support, share academic successes and difficulties, and offer guidance on college adjustment. Enrollment is restricted to College members. Please apply to be a mentor or a mentee online on the Oakes College Mentoring website.

OAKS 75 - Oakes Student Development and Leadership Theory (2)

Overview of theories, methods, applications, skills, and special topics focusing on college student development and leadership. Uses a variety of learning modes including lecture, discussion, case studies, small group interaction, and presentations. Interview only: see Oakes coordinator for residential education during spring enrollment period. Enrollment restricted to Oakes College members.

OAKS 76 - Social Geography and Justice in Santa Cruz (5)

Explores how social identities, life practices, and power are reflected and shaped by the spaces and places we live in. Combines local history and contemporary research with

placements in the community focusing on justice for children, youth, and families; topics vary by year and seek to build on the understanding and community relationships advanced through winter quarter research.

Prerequisite: Prerequisite(s): Oakes core course. Restricted to Oakes College members; others by permission of instructor.

OAKS 80H - Rainbow Theater Cultural Studies (5)

Introduction to multicultural theater and multicultural plays that aims to bring cultural awareness to all students interested in theater discipline. Students are required to read and critically analyze contemporary plays of color with emphasis on race and culture in contemporary American society.

OAKS 93 - Field Study (5)

Supervised off-campus study conducted under the immediate and direct guidance of a faculty supervisor. To be used primarily by lower-division students doing part-time off-campus study. Prerequisite(s): approval of student's adviser, certification of adequate preparation, approval of provost.

OAKS 94F - Group Tutorial (2)

A program of independent study arranged between a group of students and a faculty instructor. Students submit petition to sponsoring agency.

OAKS 95 - Directed Reading (5)

Directed reading on selected topics in literature. Students submit petition to sponsoring agency.

OAKS 99 - Tutorial (5)

Individual study for lower-division students directed by a fellow of Oakes. Students submit petition to sponsoring agency.

OAKS 99F - Independent Study (2)

Independent study on various topics to be arranged between student and instructor. Students submit petition to sponsoring agency.

Upper-Division

OAKS 130 - Writing Resistance: Creative Writing Workshop (5)

Engages diasporic and people of color (POC) writers whose work inspires social justice. Through course materials and creative exercises, students examine and break down the roadblocks that create silence. Focuses on the craft of writing, and revision and performance to create socially relevant and powerful words through community engagement.

OAKS 134 - Diasporic Central Americans (5)

Engages literature and culture from multiple generations of diasporic Central Americans in the U.S. whose work inspires conversations on politics and identity. Through course materials and oral history projects, examines the (in)visibility of this emergent Latinx group. Focus on oral history, aesthetics, poetics, and projects of representation.

OAKS 150 - Queer History and Theory in the United States (5)

Gives students a broad overview of the historical and social construction of queer identities in the United States. Through assigned readings and archival research, students contribute to the project of documenting queer history in the present. Students also examine how queer theory addresses the meanings that U.S. politics and culture have placed on sexual orientation over time.

Prerequisite: Enrollment is restricted to junior and senior Oakes College members.

OAKS 151A - Corre la Voz: Community Literacies and Power Seminar (2)

Required seminar for first-quarter students in the Corre la Voz program. Examines theories, curriculum design, and teaching methods that emphasize social connection, leadership, verbal enrichment, multi-modal literacies, and community empowerment. Taken concurrently with field study. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Co-requisite(s): course 151B. Enrollment is by interview only and successful application to the Corre la Voz program. (Formerly Corre la Voz: Community Literacies and Power.)

OAKS 151B - Community Literacies Field Study (3)

Field study for Corre la Voz interns. Intensive on-site training and participation in team teaching of dual-language (Spanish English) students (4th-5th grade). Literacies include social-emotional, expressive (artistic/dramatic), collaborative problem-solving, academic, and use of digital tools as well as traditional tools. Enrollment by interview only, and successful application to the Corre la Voz program. Concurrent enrollment in OAKS 151A is required during the first quarter after which OAKS 151B may be repeated by itself.

OAKS 152 - Transformative Literacies (5)

Combines a seminar on critical inquiry into different theories and practices of transformative literacy work with community-service placement or a creative project to assist a local organization in its mission communicating internally and externally.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to Oakes College members and community studies majors; other students may enroll by permission of the instructor.

OAKS 153 - Community Mapping (5)

Students study the theories and methods of community mapping, and work in research teams to design and conduct social-research projects. Emphasizes research questions that focus on assets and capacities, as well as on participatory-action research for justice.

Prerequisite: Prerequisite(s): satisfaction of Entry Level Writing and Composition requirements. Enrollment is restricted to Oakes College members and community studies majors.

OAKS 155 - Research for Social Justice: Special Topics (5)

Examines how social science research informs advocacy and advances social justice issues. Students analyze quantitative and qualitative data and use evidence-based findings to create a final advocacy project. Students will strengthen skills for developing research questions, interpreting qualitative and quantitative data, articulating research findings, and effectively communicating research for advocacy and public outreach. Relevant for students interested in careers in advocacy, policy, and nonprofit work.

OAKS 160 - Cuir Américas (5)

Advanced seminar on the politics of knowledge production and translation in queer theory across the Américas, considering the meaning and construction of queer/cuir in three languages. Students develop bibliographies of academic and activist work addressing the lives of queer/trans people throughout the Spanish- and Portuguese-speaking Américas, including U.S. Latinx communities. Examines gaps in translation in this field, and students practice translation of work specific to sexual minority communities based on their language training and proficiency. Class works from the language and community expertise of students in the course inspired by bilingual poetics. Final projects produce a translation of a significant article or chapter-length work in queer theory from Spanish, Portuguese, or English to another one of these languages.

Prerequisite: Prerequisites: SPAN 6, SPHS 6, or PORT 65B; or submission of a writing sample in either Spanish or Portuguese for instructor approval. Course requires language and composition proficiency in Spanish or Portuguese. Crosslisted as: Prerequisites: SPAN 6, SPHS 6, or PORT 65B; or submission of a writing sample in either Spanish or Portuguese for instructor approval. Course requires language and composition proficiency in Spanish or Portuguese.

OAKS 167 - Food Systems: Culture, Social Justice, Sustainability (5)

Examines the complexities of food systems with special attention to labor practices, food access, and food production. Students consider the nature of culture in advancing problematic notions of food options and sustainability. A service-learning project is required.

Prerequisite: Enrollment is restricted to sophomore, junior, and senior Oakes students. Non-Oakes affiliated students may email instructor for a permission code.

OAKS 185 - Tracing Health (5)

Firsthand experience with the global pandemic of COVID-19. Students train as certified contact tracers in partnership with the Public Health Institute's Tracing Health Program and work as bilingual contact tracers as part of the field study. Teaches essential skills in helping members of marginalized communities stay safe and prevent further spread of SARS-COV-2. Trainings emphasize public health protocols and cultural/linguistic competency in promoting positive health behaviors related to COVID-19. Introduces students to theories of public health, health disparities, and effective strategies for community-based health interventions. Students must be

bilingual and culturally competent in English and Spanish, Mandarin, Cantonese, Tagalog, or an indigenous language of Mexico or Central America. Interview required for acceptance in the class. Contact oakscara@ucsc.edu for instructions on applying.

OAKS 188B - Legal Field Practice: Professional Skills and Ethics (3)

Offers placement, standards, and support during on-site experiential training in professional skills and ethics for students working in the legal field or with legal information to empower under-served communities. Previous or concurrent enrollment in LGST 188A or OAKS 188A and by permission of instructor.

OAKS 189 - Building Websites for Social Change (2)

In this fast-paced course, students learn to build an interactive, user-centered websites that serve the needs of a social justice organization. First half of the course involves learning the basics of Wordpress design, meeting with stakeholders, and helping them articulate their objectives and target audiences. Second half focuses on teamwork as students work with content to develop a Wordpress site and a short user guide for our partners. Lab-based, hands-on course with minimal homework requirements.

Prerequisite: Prerequisite(s): Entry Level Writing and Composition requirements. Enrollment is restricted to sophomores, juniors, and seniors. Oakes College affiliates have preference; other students email instructor for permission.

OAKS 192 - Directed Student Teaching (5)

Teaching a lower-division seminar under faculty supervision. (See course 42.) Prerequisite(s): upper-division standing in Oakes; a proposal supported by a faculty member willing to supervise.

OAKS 193 - Field Study (5)

Supervised off-campus study conducted under the immediate and direct guidance of a faculty supervisor. To be used primarily by upper-division students doing part-time off-campus study. Prerequisite(s): approval of student's adviser, certification of adequate preparation, approval of provost. If taking two or more such courses in any one quarter, must obtain approval of academic adviser.

OAKS 195 - Senior Thesis (5)

Senior thesis related to college-sponsored individual majors. Students submit petition to sponsoring agency. Sponsoring faculty must be member of individual major committee.

OAKS 198 - Independent Field Study (5)

College-sponsored individual study programs off campus for which faculty supervision is not in person (e.g., supervision is by correspondence). Up to three such courses may be taken for credit in any one quarter. Prerequisite(s): approval of the student's adviser, certification of adequate preparation, and approval by provost.

OAKS 199 - Tutorial (5)

Individual study for junior and senior members of Oakes College directed by a fellow of Oakes. Students submit petition to sponsoring agency.

OAKS 199F - Tutorial (2)

Independent study on various topics to be arranged between student and instructor. Students submit petition to sponsoring agency.

OCEA - OCEAN SCIENCES**Lower-Division****OCEA 1 - The Oceans (5)**

An interdisciplinary introduction to oceanography focusing on biological, chemical, geological, and physical processes. Covers topics such as origins and structure of planet Earth and its oceans, co-evolution of Earth and life, plate tectonics, liquid water and the hydrologic and hydrothermal cycles, salinity and elemental cycles, ocean circulation, primary production and nutrient cycles, plankton and nekton, life on the sea floor, near shore and estuarine communities, future environmental problems our oceans face. Students may also enroll in and receive credit for EART 1.

OCEA 80A - Life in the Sea (5)

The ecology of plants and animals in oceans and coastal areas. Consideration of life in various marine habitats, including the open ocean, rocky shores, estuaries, and the sea. Includes field trips. High school biology and chemistry courses are recommended prior to taking this course.

OCEA 80B - Our Changing Planet (5)

Interdisciplinary scientific perspective on Earth system, focusing on human impacts on global environment. Introduces concepts of Earth system science and explores topics such as global warming, ozone depletion, pollution, deforestation, and future climate change. Prerequisite(s): high school chemistry course recommended.

OCEA 90 - Fundamentals of Climate (5)

Quantitative introduction to climate comprising five modules: atmosphere-ocean circulation, atmospheric teleconnections, El-Nino Southern Oscillation, the Pacific Decadal Oscillation, and global warming. Hands-on statistical methods are applied to real-world observations to develop a quantitative understanding of climate.

Upper-Division**OCEA 100 - Physical Oceanography (5)**

Introduces physical aspects of the ocean including both descriptive representations of ocean properties and dynamical processes that govern ocean circulation. Topics include measurement methods, the equation of state, the equations of motion, geostrophy, atmospheric forcing, Ekman transport, gyre

circulation, western boundary currents, the global circulation, and surface gravity waves.

Prerequisite: Prerequisite(s): MATH 11B or equivalent; and PHYS 6B; and ESCI 100A or EART 110A.

OCEA 101 - The Marine Environment (5)

An introduction to the marine environment stressing the interaction of physical, chemical, geological, and biological factors in the ocean. Provides the oceanographic background needed for studies in marine biology. Students taking the prerequisite math courses concurrently may enroll in the course with permission from instructor.

Prerequisite: Prerequisite(s): CHEM 1C and MATH 11B or MATH 19B. Students taking the prerequisite math courses concurrently may enroll in the course with permission from instructor.

OCEA 102 - Oceans and Climate: Past, Present, and Future (5)

An introduction to Earth's environment, particularly its oceanic and climatic components. Emphasizes interactions between chemical, physical, biological, and geological processes, and fundamentals of past, present, and future global environmental change. Provides backgrounds for specialized courses in oceanic or climatic change.

Prerequisite: Prerequisite(s): CHEM 1C.

OCEA 111 - Climate Dynamics (5)

Applies fundamental physical principles to the atmosphere, cryosphere, and land surface to interpret their observed properties. Interactions between the different components of the climate system, and their role in shaping Earth's climate, are also examined.

Prerequisite: Prerequisite(s): MATH 11B or equivalent; PHYS 6B; and ESCI 100A or EART 110A.

OCEA 118 - Marine Microbial Ecology (5)

The study of marine bacteria and their role in the marine ecosystem. Emphasis on biochemistry and physiology in relation to metabolic activity and elemental cycles, trophic interactions, and flows of material and energy in marine food webs. Students cannot receive credit for this course and Ocean Sciences 218.

Prerequisite: Prerequisite(s): BIOE 20C or BIOE 21C, and CHEM 1C.

OCEA 120 - Aquatic Chemistry: Principles and Applications (5)

An integrated study of the chemical behavior of natural waters with an emphasis on both principles and applications. Topics include chemical equilibrium, kinetics, acids/bases, oxidation/reduction, complexation, solid dissolution and precipitation, and reactions on solid surfaces.

Prerequisite: Prerequisite(s): CHEM 108B or CHEM 112C.

OCEA 121 - Aqueous Geochemistry (5)

Explores the geochemistry of the water-solid interface in the environment. Topics include: the composition of natural particles in the environment; the use of chemical equilibria and kinetics to assess the reactivity at the particle-water interface; and applications to environmental and oceanographic problems.

Prerequisite: Prerequisite(s): CHEM 1C, or previous or concurrent enrollment in EART 110A. Enrollment is restricted to juniors, seniors, and graduate students.

OCEA 122 - Chemical Oceanography (5)

Provides a chemical description of the sea. Emphasizes the chemical interactions of the ocean with the biosphere, atmosphere, and lithosphere. Topics include biochemical cycles and the use of chemical tracers to study oceanic and coastal processes. Students may not receive credit for this course and OCEA 220.

Prerequisite: Prerequisite(s): CHEM 1C; a previous course in ocean sciences is also recommended. Enrollment is restricted to juniors and seniors.

OCEA 124 - Aquatic Organic Geochemistry (5)

Introduction to organic geochemistry with emphasis on aquatic environments. Explores how non-living organic matter shapes biogeochemical cycles by carrying and sequestering reduced carbon and major nutrients and examines influence of chemical structure and environmental factors on transport and fate of organic molecules. Provides an introduction to organic biomarkers. Students cannot receive credit for this course and course 224.

Prerequisite: Prerequisite(s): basic college chemistry (Chemistry 1B, 1C); at least one quarter of college level organic chemistry required (e.g., Chemistry 7).

OCEA 130 - Biological Oceanography (5)

Biological description of the sea, with emphasis on processes and patterns. Topics include microbial dynamics, phytoplankton and zooplankton production, and ecology of marine food webs. Emphasis placed on understanding how physical, chemical, and geological environment shapes biology and ecology of oceans, including such topics as harmful algal blooms, global estimates of productivity, and effects of humans on environment. Students cannot receive credit for this course and Ocean Sciences 230.

Prerequisite: Prerequisite(s): previous course in ocean sciences recommended. Enrollment is restricted to juniors (with instructor approval), and seniors.

OCEA 158 - The Ecology and Conservation of Marine Birds and Mammals (5)

The systematics, physiology, ecology, behavior, and conservation of marine birds and mammals, with emphasis on the fauna and issues of the Monterey Bay area. Lectures are complemented by laboratory and field sessions. Lab topics include taxonomy and comparative morphology. Field exercises are designed to promote development of observation and

identification skills. Field trips enable students to observe unique local species in their native habitats and learn current research techniques.

Prerequisite: Prerequisite(s): OCEA 80A, BIOE 20C, or permission of instructor.

OCEA 199 - Tutorial (5)

Students submit petition to sponsoring agency.

Graduate**OCEA 200 - Physical Oceanography (5)**

Introduces the physics of the ocean. Topics include physical properties of seawater, atmospheric forcing, Ekman dynamics, Sverdrup dynamics, the wind-driven ocean circulation, ocean mixing, water masses, the meridional overturning circulation, surface gravity waves, Rossby waves, Kelvin waves, and ocean tides. Designed for beginning graduate students in ocean sciences and upper-division science majors. Calculus and physics recommended as preparation.

OCEA 201 - Advanced Physical Oceanography (5)

Covers advanced topics and physical principles as they relate to the ocean circulation. Designed as a follow-on class for OCEA 200, Physical Oceanography, and topics covered include: the dynamics of the subtropical gyres; potential vorticity dynamics; ventilated thermocline theory; the abyssal circulation; barotropic and baroclinic instability; and ocean eddies. Students use simple computer models to explore these important topics further, and review seminal papers.

Prerequisite: Prerequisite(s): OCEA 200, or a graduate geophysical fluid dynamics course or equivalent (e.g. EART 272/OCEA 272, AM 217, AM 227), or by instructor consent. Enrollment is restricted to graduate students.

OCEA 211 - Climate Dynamics (5)

Introduction to the dynamics of the Earth climate system. Topics: climate system components, the global energy balance, radiative transfer, the hydrological cycle, general circulations of the atmosphere and ocean, El Niño, the North Atlantic Oscillation, and the Pacific Decadal Oscillation.

Prerequisite: Enrollment is restricted to graduate students. Undergraduates may enroll by permission of instructor. Previous courses in calculus and ocean sciences or earth sciences are recommended.

OCEA 213 - Biogeochemical Cycles (5)

Overview of biogeochemical cycles, present and past, and geochemical models. Topics include: marine, terrestrial, and global views of the carbon, nitrogen, phosphorus, silicon, sulfur, and oxygen cycles, and the evolution of these cycles and Earth's redox balance through geologic time.

Prerequisite: Enrollment is restricted to graduate students. Upper-division undergraduates may enroll with instructor approval. College-level chemistry and an upper-division course in at least one relevant discipline are recommended.

OCEA 215 - Predicting the Atmosphere, Ocean, and Climate (5)

Introduction to the theory and practice of operational prediction in meteorology, oceanography, and climate. Topics: observations and estimation theory, dynamic adjustment and initialization, estimation theory, data assimilation, forecast verification, predictability, ocean state estimation, seasonal forecasting.

Prerequisite: Enrollment is restricted to graduate students. Undergraduates may enroll with instructor approval. OCEA 200, OCEA 260, EART 272, or equivalents are recommended.

OCEA 218 - Marine Microbial Ecology (5)

Recent developments in the study of marine bacteria and their role in the marine ecosystem. Emphasis on biochemistry and physiology in relation to metabolic activity and elemental cycles, trophic interactions and flows of material and energy in marine food webs. Exams and research paper required. Students cannot receive credit for this course and OCEA 118 and BIOL 171. BIOL 20C and CHEM 1C recommended.

OCEA 220 - Chemical Oceanography (5)

A chemical description of the sea; emphasis on the chemical interactions of the oceans with the biosphere, atmosphere, and lithosphere. Topics include biogeochemical cycles and the use of chemical tracers to study oceanic and coastal processes. Course designed for graduate students; available to upper-division science majors. Students may not receive credit for this course and OCEA 122.

OCEA 224 - Aquatic Organic Geochemistry (5)

Introduction to organic geochemistry with emphasis on aquatic environments. Explores how non-living organic matter shapes biogeochemical cycles by carrying and sequestering reduced carbon and major nutrients and examines influence of chemical structure and environmental factors on transport and fate of organic molecules. Provides an introduction to organic biomarkers. Students cannot receive credit for this course and OCEA 124.

OCEA 230 - Biological Oceanography (5)

Biological description of the sea, with emphasis on processes and patterns. Topics include microbial dynamics, phytoplankton and zooplankton production, and ecology of marine food webs. Emphasis placed on understanding how physical, chemical, and geological environment shapes biology and ecology of oceans, including such topics as harmful algal blooms, global estimates of productivity, and effects of humans on environment. Students cannot receive credit for this course and OCEA 130.

Prerequisite: Prerequisite(s): previous course in ocean sciences recommended. Enrollment is restricted to graduate students.

OCEA 241 - Dynamics of Marine Ecosystems (5)

Covers physical-biogeochemical interactions in the ocean on marine ecosystems, with a special focus on the California Current region. Lectures introduce fundamental processes occurring at local, regional, and basin scales, and describe their complex interplay.

Prerequisite: Enrollment is restricted to graduate students.

OCEA 260 - Introductory Data Analysis in the Ocean and Earth Sciences (5)

Introduces data analysis methods regularly encountered within the ocean and earth sciences. Topics include: error propagation, least squares analysis, data interpolation methods, empirical orthogonal functions, and Monte Carlo methods applied to problems drawn from oceanographic and earth sciences datasets. Introduces and uses a high-level computing and visualization package, MATLAB. Student project consists of analysis of the student's own dataset.

Prerequisite: Prerequisite(s): previous course in ocean or earth sciences is recommended. Enrollment is restricted to graduate students; undergraduates with permission of instructor.

OCEA 267 - Applied Environmental Time Series Analysis (5)

Course takes an empirical approach to quantify and explain changes in the Earth system over time. Students learn how to analyze time-series data and answer questions about environmental change and variability. Students acquire the theoretical basis of the statistical approaches, gain experience interpreting and discussing the results, and debate the methods chosen resulting in a critical understanding of the underlying assumptions and limitations of the methods discussed. This is a hands-on class and utilizes a suite of observational datasets and outputs from Earth system models. Students cannot receive credit for this course and ESCI 167.

Prerequisite: Prerequisite(s): Students are expected to know R, Matlab or Python and have statistics background. Please contact the instructor before enrolling if you are unsure. Enrollment is restricted to graduate students.

OCEA 280 - Marine Geology (5)

Geology of the marine environment. Topics include controls on the types, origin, and distribution of marine sediments; geology of oceanic crust; evolution of continental margins and plate boundaries; and introduction to paleoceanography. Students cannot receive credit for this course and EART102.

Prerequisite: Enrollment is restricted to graduate students.

OCEA 285 - Past Climate Change (5)

Reviews the fundamentals of climate dynamics and explores how Earth's environment is a product of the interaction of its components. Uses examples of climate change from historical and geologic records, and from predictions of the future. Recommended for junior, senior, and graduate students in the sciences.

OCEA 286 - Introduction to Ocean Modeling (5)

Fundamental concepts and ideas that underpin numerical modeling of the ocean. Topics include numerical methods and solutions of partial differential equations (PDEs), ocean circulation, wave dynamics, ocean ecosystem model, and MATLAB programming.

Prerequisite: Enrollment is restricted to graduate students, or seniors by permission of instructor.

OCEA 290A - Topics in Chemical Oceanography (5)

A weekly seminar series covering recent developments in chemical oceanography. Different topics and approaches will be stressed from year to year.

OCEA 290B - Topics in Biological Oceanography (5)

Explores different problems of special interest in biological oceanography. Different topics and approaches will be stressed from year to year.

OCEA 290C - Topics in Marine Geochemistry (5)

Selected topics in geochemistry. Discussion of theoretical models, different approaches, and recent research. Topics vary from year to year.

OCEA 290D - Topics in Marine Microbiology (5)

A weekly seminar series covering topics in environmental microbiology. Topics vary from year to year, and will include research in ecology, methodology, biochemistry and physiology of bacteria. Emphasis on the role of bacteria in biogeochemical cycling from microzone to global scales, with particular focus in marine systems.

OCEA 290E - Topics in Climatic and Oceanic Change (5)

Weekly seminar series covering recent developments in climatic and oceanic change. Different topics and approaches stressed from year to year. Prerequisite(s): interview with instructor prior to first class meeting.

OCEA 290G - Topics in Physical Oceanography (5)

Weekly seminar series covering topics in physical oceanography as well as biological-physical interactions in the oceans. Different topics and approaches stressed from year to year.

Prerequisite: Enrollment is restricted to graduate students; undergraduates may enroll with permission of instructor.

OCEA 290H - Topics in Ocean Optics (5)

Examines recent developments and application of bio-optics to the marine environment, including theory, instrumentation, and remote sensing. Different topics and approaches emphasized from year to year.

Prerequisite: Prerequisite(s): previous course in ocean sciences recommended. Enrollment is restricted to graduate students; senior undergraduates with permission of instructor.

OCEA 290J - Topics in Marine Organic Geochemistry (5)

Examines recent developments in uses of organic geochemistry to trace oceanographic and biogeochemical processes. Focuses on introduction to organic biomarkers, current literature, and evolving applications. Different topics and approaches emphasized from year to year.

Prerequisite: Prerequisite(s): previous course in ocean sciences and organic chemistry are recommended. Enrollment is restricted to graduate students; upper-division undergraduates with instructor's permission.

OCEA 292 - Seminar (0)

Weekly seminar on various topics attended by faculty, graduate, and upper-division undergraduate students.

OCEA 296 - Teaching in Ocean Sciences (2)

For new and/or relatively inexperienced graduate students in pedagogy of ocean sciences. Role and responsibilities of teaching in ocean sciences described and developed. Includes discussions about effective teaching methods; hands-on issues for work in the laboratory; university expectations; and regulations regarding teaching, organizational strategies, time management, and working with instructors and staff.

Prerequisite: Prerequisite(s): graduate standing or permission of instructor. Enrollment is restricted to graduate students.

OCEA 297A - Independent Study (5)

Independent reading, research, and written reports not related to thesis research. Students submit petition to sponsoring agency.

OCEA 297B - Independent Study (10)

Independent reading, research, and written reports not related to thesis research. Students submit petition to sponsoring agency.

OCEA 297C - Independent Study (15)

Independent reading, research, and written reports not related to thesis research. Students submit petition to sponsoring agency.

OCEA 299A - Thesis Research (5)

Students submit petition to sponsoring agency.

OCEA 299B - Thesis Research (10)

Students submit petition to sponsoring agency.

OCEA 299C - Thesis Research (15)

Students submit petition to sponsoring agency.

PBS - PHYSICAL BIOLOGICAL SCIENCES

Upper-Division

PBS 101 - Cal Teach: Pedagogy for Learning Assistants (2)

Supports and prepares learning assistants (LAs) for success in active classrooms. Helps LAs integrate learning theory and effective practices to facilitate thinking and learning when students work in small groups on conceptual problems. Prerequisite(s): Successful completion of the course or equivalent in which the student will serve as an LA. Concurrent participation as an LA for a University STEM course is required. Enrollment is by application via the online form and a follow-up interview for selected applicants

PBS 102A - Cal Teach: Advanced Pedagogy for Learning Assistants (1)

Advanced learning assistants (LAs) continue to explore learning theory and practical strategies for engaging students in thinking and learning. Prerequisite(s): PBS 101. Enrollment is by application and by permission of instructor and is restricted to sophomores, juniors, and seniors.

PBS 102B - Cal Teach: Advanced Pedagogy for Learning Assistants (2)

Advanced learning assistants (LAs) explore learning theory and practical strategies for engaging students in thinking and learning. Returning LAs in this course take on an advanced project involving one or more of the following: mentoring of new LAs, data collecting, research into teaching/learning, and/or the development of learning activities. Prerequisite(s): PBS 101. Enrollment is by permission following application and is restricted to sophomores, juniors, and seniors.

PBS 182 - ACE Program Service Learning (2)

Students participate in training and development to co-facilitate collaborative learning in ACE active learning sessions and final exam review sessions. Students are role models for students pursuing science- and math-intensive majors. Prerequisite(s): Prior participation in ACE; good academic standing; no non-passing grades in prior quarter. Enrollment is restricted to sophomores, juniors, and seniors.

PERS - PERSIAN

Lower-Division

PERS 1 - First-Year Persian (5)

Introduction to Persian (Farsi) and Persian-speaking culture with practice in all four language skills: listening, speaking, reading, and writing. Intended for students with no previous study of Persian as well as heritage speakers.

PERS 2 - First-Year Persian (5)

Introduction to Persian (Farsi) and Persian-speaking culture with practice in all four language skills: listening, speaking, reading, and writing. Intended for students with no previous study of Persian as well as heritage speakers.

Prerequisite: Prerequisite(s): PERS 1 or comparable proficiency.

PERS 3 - First-Year Persian (5)

Introduction to Persian (Farsi) and Persian-speaking culture with practice in all four language skills: listening, speaking, reading, and writing. Intended for students with no previous study of Persian as well as heritage speakers.

Prerequisite: Prerequisite(s): PERS 2 or comparable proficiency.

PHIL - PHILOSOPHY

Lower-Division

PHIL 7 - Elementary Logic (5)

An elementary introduction to formal logic and formal reasoning with an emphasis on applications of formal deductive systems. Students trained to think with rigor and precision and appreciate the value of logical reasoning and dispassionate logical analysis through proving the validity and analyzing the structure of symbolized natural language arguments. Students may not receive credit for this courses and PHIL 9.

PHIL 8 - Reason, Logic, and the Idols of Thought (5)

Students cultivate their ability to distill and critically assess the barrage of argument and rhetoric with which they are confronted every day—on the Internet, in the media, on campus—and learn to subject their own thoughts to more rigorous, logical standards.

PHIL 9 - Introduction to Logic (5)

A first course in symbolic deductive logic. Major topics include (but are not limited to) the study of systems of sentential logic and predicate logic, including formal deduction, semantics, and translation from natural to symbolic languages.

PHIL 11 - Introduction to Philosophy (5)

An introduction to the main areas of philosophy through critical reflection on and analysis of both classical and contemporary texts. Focuses on central and enduring problems in philosophy such as skepticism about the external world, the mind-body problem, and the nature of morality.

PHIL 12 - Philosophy and Film (2)

Explores the philosophy of film through the viewing and discussion of several philosophically interesting films. Examines both the aesthetics of film and a variety of philosophical issues that particular films raise.

PHIL 13 - Eastern Philosophy (2)

Covers perspectives of Eastern philosophy; specifically, Hinduism, Jainism, Buddhism, Daoism, and Confucianism. Includes views concerning the nature of ultimate reality, personal identity, morality, the afterlife, god(s), and the problem of evil.

PHIL 15 - Technology, Knowledge, and Human Life (2)

Provides a clearer understanding of what technology is how it relates to knowledge and human life. Students read and discuss texts by Plato, Aristotle, Husserl, and Heidegger.

PHIL 17 - Feminist Philosophy (5)

Introduction to feminist philosophy. The topics may include (but are not limited to) oppression, normalization, discrimination, objectification, misogyny, androcentrism, patriarchy, the sex-gender distinction, sexed embodiment,

gendered labor, and the relationships between sexism, racism, homophobia, and transphobia.

PHIL 22 - Introduction to Ethical Theory (5)

A consideration of ethical issues and theories focusing on the foundation of moral value and the principles governing character and behavior. Designed to extend and develop the student's abilities in philosophical reasoning about ethics.

PHIL 23 - Philosophy of Cognitive Science (5)

Explores the philosophical issues that arise in cognitive science, particularly issues concerning the nature of minds. Students consider the idea that the mind is a digital computer, then analyze alternatives, such as connectionism and dynamics.

PHIL 24 - Introduction to Ethics: Contemporary Moral Issues (5)

An examination of the conceptual and moral issues that arise in connection with a variety of specific ethical issues. Topics vary according to the interests of the instructor, but among those commonly discussed are: abortion, war and violence, euthanasia, world hunger, human rights, and animal rights. The readings are typically drawn from recent philosophical articles on these topics, but earlier sources (important in the history of philosophy) can be considered as well.

PHIL 26 - Existentialism and After (5)

A survey of recent movements in European thought, such as phenomenology, existentialism, hermeneutics, critical theory, continental feminism, and poststructuralism, with some attention to their 19th-century precursors. Selections from major philosophical treatises are supplemented with literary works.

PHIL 27 - Business Ethics (5)

Examination of the ethical issues that arise in connection with a variety of specific business contexts. Common topics include: advertising, environmental harm, employee-employer relationships, finance, capitalism, market failure, government regulation, work-life balance, and consumer rights.

PHIL 28 - Environmental Ethics (5)

This course is an introduction to the moral issues raised by our interactions with nonhuman animals and with the rest of the natural environment. The course will relate traditional moral theories to contemporary literature on the ethics of nature conservation and environmental protection. The course is intended as a first course in philosophy as well as a first course in ethics; therefore, questions concerning the nature of philosophical inquiry and the ways in which philosophical inquiry is different from inquiries conducted within other disciplines will also be addressed.

PHIL 30S - Introductory Topics in Value Theory (5)

Examines some aspect of the nature of goodness or value. Topics vary each quarter and may include themes in aesthetics, ethics, and social and political philosophy.

PHIL 31S - Introductory Topics in Metaphysics and

Epistemology (5)

Examines the nature of knowledge and the fundamental structure and nature of reality. Topics vary each quarter and may include nominalism, metaphysical realism, and the ontological analysis of concrete particulars, problems of modality and persistence through time, the problem of other minds, the nature of justification and knowledge, skepticism of the external world, the nature and limits of human rationality, and the problem of induction.

PHIL 32S - Introductory Topics in the Philosophy of Mind (5)

Examines the nature of mind. Topics vary each quarter and may include the relation between mind and matter, the nature of consciousness, artificial intelligence, animal consciousness and intelligence, and the relation between thought and language.

PHIL 33S - Introductory Topics in the Philosophy of Science (5)

Examines the nature of science. Topics vary each quarter and may include realism, instrumentalism, confirmation, explanation, space and time, and rational decision making.

PHIL 34S - Introductory Topics in the Philosophy of Language (5)

Examines the nature of language. Topics vary each quarter and may include theories of meaning, representation, reference and truth.

PHIL 35S - Introductory Topics in the History of Philosophy (5)

Examines historical philosophical texts. Topics vary each quarter and focus on some major philosophical period, figure, or work in the history of philosophy.

PHIL 36S - Introductory Topics in Philosophy and Contemporary Culture (5)

Examines aesthetic, ethical, and/or political aspects of contemporary culture. Topics vary each quarter and may include the philosophy of film, music and other genres of popular culture and may consider issues such as authenticity, rebellion, identity, and politics.

PHIL 80C - Philosophy of Sex and Love (5)

What is the nature of love? Is marriage a means of social control? Does pornography empower or oppress women? How is gender constructed? This course provides a systematic investigation of the development of Western philosophical perspectives on gender and sexuality from Ancient Greece to the 21st century. Topics include love, marriage, sexual perversion, promiscuity and monogamy, pornography, feminism, and sexual morality. Aims to promote critical reflection with regard to the ethical, political, and social implications for contemporary society.

PHIL 80E - Latin American Philosophy (5)

Is there a general school of philosophy endemic to Latin America? Would it have to appeal to quintessential Western philosophical questions regarding knowledge, values, and reality? If not, why not, and would it then still count as philosophy? What difference do ethnic and national diversity,

as well as strong political and social inequality, make to the development of philosophical questions and frameworks? Course explores a variety of historically situated Latin American thinkers who investigate ethnic identity, gender, and socio-political inequality and liberation, and historical memory, and who have also made important contributions to mainstream analytical and continental philosophy.

PHIL 80M - Science and Society (5)

Focuses on the urgent ethical and political issues raised by data science and society, building on consideration of foundational issues in moral philosophy and a technical understanding of advances in machine learning. Topics include: algorithmic bias and discrimination, predictive policing, self-driving cars, consent to data collection, surveillance and privacy rights, democracy and free speech online, attentional modification, technology and disability, and the singularity. Each unit pairs readings from philosophical and legal scholarship with case studies documented in scientific articles, news stories, and podcasts. (Formerly Philosophical Foundations of Science Studies.)

PHIL 80S - The Nature of Science (5)

A survey of what philosophers have said about the nature of science and scientific change. Emphasis is placed on whether science is best characterized as the gradual accumulation of truth or whether truth is irrelevant to scientific change.

PHIL 99 - Tutorial (5)

Upper-Division

PHIL 100A - Ancient Greek Philosophy (5)

Survey of ancient Greek philosophy of the Classical and Hellenistic periods. Begins with Socrates and the pre-Socratics, then undertakes an intensive study of Plato and Aristotle. Course then surveys the main developments that follow: Epicureanism, Stoicism, and Skepticism.

Prerequisite: Prerequisite(s): PHIL 8 or PHIL 9; one course from PHIL 11 or PHIL 22 or PHIL 23 or PHIL 24 or PHIL 80E or BME 80G/PHIL 80G or PHIL 80M or PHIL 80S; and satisfaction of the Entry Level Writing and Composition requirements.

PHIL 100B - The Rationalists (5)

A study of the historical background and the present relevance of Descartes, Spinoza, and Leibniz.

Prerequisite: Prerequisite(s): PHIL 8 or PHIL 9; one course from PHIL 11 or PHIL 22 or PHIL 23 or PHIL 24 or PHIL 80E or BME 80G/PHIL 80G or PHIL 80M or PHIL 80S; and satisfaction of the Entry Level Writing and Composition requirements.

PHIL 100C - The Empiricists (5)

A critical study (based on original texts) of Locke, Berkeley, and especially Hume on the nature of knowledge, perception, causation, morality, religion, and political society.

Prerequisite: Prerequisite(s): PHIL 8 or PHIL 9; one course from PHIL 11 or PHIL 22 or PHIL 23 or PHIL 24 or PHIL 80E or PHIL 80G or PHIL 80M or PHIL 80S; and satisfaction of the Entry Level Writing and Composition requirements.

PHIL 106 - Kant (5)

Intensive study of Kant's philosophy, particularly his epistemology and metaphysics developed in his Critique of Pure Reason.

Prerequisite: Prerequisite(s): PHIL 9; one course from PHIL 11 or PHIL 22 or PHIL 23 or PHIL 24 or PHIL 80E or 80G or PHIL 80M or PHIL 80S; and PHIL 100A or PHIL 100B or PHIL 100C.

PHIL 107 - Nineteenth-Century Philosophy (5)

A study of some European philosophers of the 19th century, with particular attention to Hegel, Schopenhauer, and Nietzsche. (Formerly course 108.)

Prerequisite: Prerequisite(s): PHIL 9; one from PHIL 11 or PHIL 22 or PHIL 23 or PHIL 24 or PHIL 80E or BME 80G/PHIL 80G or PHIL 80M or PHIL 80S; and PHIL 100A or PHIL 100B or PHIL 100C.

PHIL 108 - Phenomenology (5)

French phenomenology includes primarily the work of Jean-Paul Sartre, Simone de Beauvoir, and Maurice Merleau-Ponty. Additional topics include the nature of consciousness and agency. Course includes discussions of French feminists' reactions to Simone de Beauvoir and Emmanuel Levinas.

Prerequisite: Prerequisite(s): PHIL 9; PHIL 11 or PHIL 22 or PHIL 24; PHIL 100A or PHIL 100B or PHIL 100C.

PHIL 111 - Continental Philosophy (5)

Study of recent work in continental philosophy. Topics vary.

Prerequisite: Prerequisite(s): PHIL 9; one from PHIL 11 or PHIL 22 or PHIL 23 or PHIL 24 or PHIL 80E or BME 80G/PHIL 80G or PHIL 80M or PHIL 80S; and PHIL 100A or PHIL 100B or PHIL 100C.

PHIL 112 - American Philosophy (5)

Study of classical American philosophers, specifically Emerson, Peirce, James, and Dewey, with emphasis on their views of metaphysics, epistemology, ethics, and philosophy of religion. Some attention is also paid to recent pragmatic tendencies in American philosophy.

Prerequisite: Prerequisite(s): PHIL 9; one from PHIL 11 or PHIL 22 or PHIL 23 or PHIL 24 or PHIL 80E or BME 80G/PHIL 80G or PHIL 80M or PHIL 80S; and PHIL 100A or PHIL 100B or PHIL 100C.

PHIL 113 - The History of Analytic Philosophy (5)

Examination of the beginnings and development of analytic philosophy, with primary interest in the reformulation of traditional philosophical problems beginning with Frege. Other

figures studied include, but are not limited to, Russell, Carnap, Wittgenstein, Quine, and Sellars.

Prerequisite: Prerequisite(s): PHIL 9; one from PHIL 11 or PHIL 22 or PHIL 23 or PHIL 24 or PHIL 80E or BME 80G/PHIL 80G or PHIL 80M or PHIL 80S; and PHIL 100A or PHIL 100B or PHIL 100C.

PHIL 114 - Probability and Confirmation (5)

Studies the philosophical foundations of probability, induction, and confirmation. Different interpretations of probability studied, and solutions to various problems and paradoxes investigated. Students cannot receive credit for this course and course 214.

Prerequisite: Prerequisite(s): PHIL 9; one from PHIL 11 or PHIL 22 or PHIL 23 or PHIL 24 or PHIL 80E or BME 80G/PHIL 80G or PHIL 80M or PHIL 80S; and PHIL 100A or PHIL 100B or PHIL 100C.

PHIL 116 - Logic, Sets, and Functions (5)

Introduction to basic set theory, recursive definitions, and mathematical induction. Provides a bridge between course 9 and courses 117 and 119. Strong emphasis on proving theorems and constructing proofs, both formal proofs and proofs in the customary, informal style used by mathematicians.

Prerequisite: Prerequisite(s): PHIL 9; one from PHIL 11, PHIL 22, PHIL 23, PHIL 24, PHIL 80E, BME 80G/PHIL 80G, PHIL 80M, PHIL 80S; and PHIL 100A or PHIL 100B or PHIL 100C.

PHIL 117 - Non-Classical Logic (5)

Investigations of non-classical logic. Studies several non-classical logics, such as various modal logics, multi-valued logics, and relevance logics. Investigates meta-theoretic results for each logic studied.

Prerequisite: Prerequisite(s): PHIL 9; one from PHIL 11 or PHIL 22 or PHIL 23 or PHIL 24 or PHIL 80E or BME 80G/PHIL 80G or PHIL 80M or PHIL 80S; and PHIL 100A or PHIL 100B or PHIL 100C.

PHIL 118 - Stoic Ethics (5)

Surveys Stoic Ethics in the Hellenistic and Roman Periods, attending both to the theoretical writings of early Stoa (e.g., Zeno and Chrysippus) as well as to the therapeutic and protreptic writings of later figures (e.g., Seneca and Epictetus).

Prerequisite: Prerequisite(s): PHIL 9; one from PHIL 11 or PHIL 22 or PHIL 23 or PHIL 24 or PHIL 80E or BME 80G/PHIL 80G or PHIL 80M or PHIL 80S; and PHIL 100A or PHIL 100B or PHIL 100C.

PHIL 119 - Intermediate Logic (5)

Detailed treatment of the semantics of first order logic and formal computability. Completeness, undecidability of first order logic and Lowenheim-Skolem results also proven. Nature and formal limits of computability and introduction to incompleteness also investigated. Students cannot receive credit for this course and course 219.

Prerequisite: Prerequisite(s): PHIL 9; one from PHIL 11 or PHIL 22 or PHIL 23 or PHIL 24 or PHIL 80E or BME 80G/PHIL 80G or PHIL 80M or PHIL 80S; and PHIL 100A or PHIL 100B or PHIL 100C.

PHIL 121 - Epistemology (5)

A sustained look at central problems in epistemology. Topics might include the problem of other minds, the nature of justification and knowledge, skepticism of the external world, the nature and limits of human rationality, the problem of induction. (Formerly Knowledge and Rationality.)

Prerequisite: Prerequisite(s): PHIL 9; one from PHIL 11 or PHIL 22 or PHIL 23 or PHIL 24 or PHIL 80E or BME 80G/PHIL 80G or PHIL 80M or PHIL 80S; and PHIL 100A or PHIL 100B or PHIL 100C.

PHIL 122 - Metaphysics (5)

Survey of contemporary analytic metaphysics. Topics may include nominalism, metaphysical realism, and the ontological analysis of concrete particulars, including problems of modality and persistence through time.

Prerequisite: Prerequisite(s): PHIL 9; one from PHIL 11 or PHIL 22 or PHIL 23 or PHIL 24 or PHIL 80E or BME 80G/PHIL 80G or PHIL 80M or PHIL 80S; and PHIL 100A or PHIL 100B or PHIL 100C.

PHIL 123 - Philosophy of Language (5)

Current theories of the nature and preconditions of language, the nature of meaning, and the nature of truth.

Prerequisite: Prerequisite(s): PHIL 9; one from PHIL 11 or PHIL 22 or PHIL 23 or PHIL 24 or PHIL 80E or BME 80G/PHIL 80G or PHIL 80M or PHIL 80S; and PHIL 100A or PHIL 100B or PHIL 100C.

PHIL 124 - Other Minds (5)

An examination of the traditional philosophical problem of other minds and related contemporary scientific issues concerning what it is to encounter a mind that is not one's own and is relevantly unlike one's own.

Prerequisite: Prerequisite(s): PHIL 9; one from PHIL 11 or PHIL 22 or PHIL 23 or PHIL 24 or PHIL 80E or BME 80G/PHIL 80G or PHIL 80M or PHIL 80S; and PHIL 100A or PHIL 100B or PHIL 100C.

PHIL 125 - Philosophy of Science (5)

An examination of various topics that arise in thinking about science. Different philosophical problems, such as realism, instrumentalism, confirmation, explanation, space and time, and rational decision making are extensively discussed and criticized.

Prerequisite: Prerequisite(s): PHIL 9; one from PHIL 11 or PHIL 22 or PHIL 23 or PHIL 24 or PHIL 80E or BME 80G/PHIL 80G or PHIL 80M or PHIL 80S; and PHIL 100A or PHIL 100B or PHIL 100C.

PHIL 126 - Philosophy of Social Sciences (5)

Examines philosophical concerns regarding the methods and assumptions of the social sciences. For example, must the methods of the social sciences differ in some important ways from those used by the natural sciences? Another issue concerns problems arising from studying groups where the very notion of rationality appears to vary from culture to culture or over historical periods.

Prerequisite: Prerequisite(s): PHIL 9; one from course PHIL 11 or PHIL 22 or PHIL 23 or PHIL 24 or PHIL 80E or BME 80G/PHIL 80G or PHIL 80M or PHIL 80S; and PHIL 100A or PHIL 100B or PHIL 100C.

PHIL 127 - Philosophy of Biology (5)

Can developmental processes be reduced to gene expression? Does the history of life exhibit trends (e.g. increasing complexity)? How are we to understand key concepts such as fitness, species, adaptation, and gene? Is there such a thing as human nature? Course surveys these and other core philosophical topics in the biological sciences.

Prerequisite: Prerequisite(s): PHIL 9; PHIL 11 or PHIL 22 or PHIL 24; PHIL 100A or PHIL 100B or PHIL 100C.

PHIL 133 - Philosophy of Mind (5)

Focuses on philosophical questions concerning the nature of mind. Central topics include the relation between mind and matter, and the nature of consciousness. Other topics typically explored include: artificial intelligence; animal consciousness and intelligence; and the relation between thought and language.

Prerequisite: Prerequisite(s): PHIL 9; one from PHIL 11 or PHIL 22 or PHIL 23 or PHIL 24 or PHIL 80E or BME 80G/PHIL 80G or PHIL 80M or PHIL 80S; and PHIL 100A or PHIL 100B or PHIL 100C.

PHIL 135 - Philosophy of Psychology (5)

Looks at philosophical issues raised by current research on the nature of perception, cognition, and consciousness in psychology and cognitive science or neuroscience. Can there be a science of the mind? Could machines be conscious? Do animals have minds? How did the mind evolve? These and a host of related questions form the subject matter of this course.

Prerequisite: Prerequisite(s): PHIL 9; one from PHIL 11 or PHIL 22 or PHIL 23 or PHIL 24 or PHIL 80E or BME 80G/PHIL 80G or PHIL 80M or PHIL 80S; and PHIL 100A or PHIL 100B or PHIL 100C. Enrollment is restricted to sophomores, juniors, and seniors.

PHIL 140 - History of Ethics (5)

A careful study of any one or a number of selected primary texts in the history of moral philosophy, with some emphasis on the relation to contemporary issues.

Prerequisite: Prerequisite(s): PHIL 9; one from PHIL 11 or PHIL 22 or PHIL 23 or PHIL 24 or PHIL 80E or BME

80G/PHIL 80G or PHIL 80M or PHIL 80S; and PHIL 100A or PHIL 100B or PHIL 100C.

PHIL 142 - Advanced Ethics (5)

An examination of central issues in ethical theory including the nature of and justification for the moral point of view, the place of reason in ethics, the status of moral principles, and the nature of moral experience.

Prerequisite: Prerequisite(s): PHIL 9; one from PHIL 11 or PHIL 22 or PHIL 23 or PHIL 24 or PHIL 80E or BME 80G/PHIL 80G or PHIL 80M or PHIL 80S; and PHIL 100A or PHIL 100B or PHIL 100C.

PHIL 143 - Applied Ethics: Ethics Bowl (5)

Intensive application of ethics through Ethics Bowl-style debate. Cases change annually. Students develop oral advocacy skills and are given the opportunity to compete for a position on the extracurricular Ethics Bowl team.

PHIL 144 - Topics in Social and Political Philosophy (5)

A study of selected classical and contemporary writings dealing with topics such as the nature and legitimacy of the liberal state, the limits of political obligation, and theories of distributive justice and rights. (Formerly Social and Political Philosophy.)

Prerequisite: Prerequisite(s): PHIL 9; one from PHIL 11 or PHIL 22 or PHIL 23 or PHIL 24 or PHIL 80E or BME 80G/PHIL 80G or PHIL 80M or PHIL 80S; and PHIL 100A or PHIL 100B or PHIL 100C.

PHIL 147 - Topics in Feminist Philosophy (5)

Topics in feminist philosophy, which may include: the nature of feminist philosophy, feminist approaches to philosophical issues, social and political philosophy, theories of knowledge, ethics, aesthetics, and science, technology, and medicine studies. Presupposes some familiarity with philosophy or feminist scholarship.

Prerequisite: Prerequisite(s): PHIL 9; one from PHIL 11 or PHIL 22 or PHIL 23 or PHIL 24 or PHIL 80E or BME 80G/PHIL 80G or PHIL 80M or PHIL 80S; and PHIL 100A or PHIL 100B or PHIL 100C.

PHIL 148 - The Holocaust and Philosophy (5)

By using the historiography of the Holocaust as a case study, examines the epistemology and ontology of historical knowledge, i.e., how the past is known, and what about it there is to know.

Prerequisite: Prerequisite(s): PHIL 9; one from PHIL 11 or PHIL 22 or PHIL 23 or PHIL 24 or PHIL 80E or BME 80G/PHIL 80G or PHIL 80M or PHIL 80S; and PHIL 100A or PHIL 100B or PHIL 100C. Enrollment is restricted to juniors and seniors.

PHIL 152 - Aesthetics (5)

Problems about form, meaning, and interpretation in art, as found in major aesthetic theories from the philosophical

tradition, and also in a variety of encounters between recent philosophy and the arts.

Prerequisite: Prerequisite(s): PHIL 9; one from PHIL 11 or PHIL 22 or PHIL 23 or PHIL 24 or PHIL 80E or BME 80G/PHIL 80G or PHIL 80M or PHIL 80S; and PHIL 100A or PHIL 100B or PHIL 100C.

PHIL 153 - Philosophy of Race (5)

Topics include conceptual-analytical and political-social issues. Selected topics may include: the ontology of race; race as real or constructed; scientific understandings of race; race and identity; and color-blind versus color-sensitive theories of justice and political policy.

Prerequisite: Prerequisite(s): PHIL 9; one from course PHIL 11 or PHIL 22 or PHIL 23 or PHIL 24 or PHIL 80E or BME 80G/PHIL 80G or PHIL 80M or PHIL 80S; and PHIL 100A or PHIL 100B or PHIL 100C.

PHIL 190 - Senior Seminar (5)

Special topics. Format varies each quarter. Prerequisite(s): PHIL 9; and two from PHIL 100A, PHIL 100B, and PHIL 100C. Enrollment restricted to senior philosophy majors and by permission of the instructor.

PHIL 195A - Senior Essay (5)

Preparation of senior essay (approximately 25 pages) during one quarter. Students submit petition to sponsoring agency.

PHIL 195B - Senior Essay (5)

Under exceptional circumstances, a second senior essay continuing the work of the first essay is permitted but only when the first senior essay has been completed. Students submit petition to sponsoring agency.

PHIL 199 - Tutorial (5)

PHIL 199F - Tutorial (2)

Students submit petition to sponsoring agency.

Graduate

PHIL 202 - Topics in Ancient Greek Philosophy (5)

Topics will vary each quarter and will focus on some major ancient Greek philosophical figure or work.

Prerequisite: Enrollment is restricted to philosophy graduate students.

PHIL 203 - Autism (5)

Explores autism and its implications for various fields of inquiry, especially philosophy. Previous familiarity with autism is not presupposed. Some background in philosophy of mind, cognitive science, and psychology recommended.

Prerequisite: Enrollment is restricted to graduate students.

PHIL 213 - Origins of Analytic Philosophy (5)

Analytic philosophy remains the dominant philosophical style worldwide. As a style of philosophy, analytic philosophy places emphasis on logical form and on the use of logical structure as the key element for evaluating the normative status (the logical merits) of a specific position. The history of analytic philosophy remains key since core debates turn on the status of logic as a supposedly value-neutral tool. This impacts philosophical understanding regarding logic, mathematics, and the relation of these areas to the natural and social sciences.

Prerequisite: Enrollment is restricted to graduate students.

PHIL 214 - Probability and Confirmation (5)

Studies the philosophical foundations of probability, induction, and confirmation. Different interpretations of probability studied, and solutions to various problems and paradoxes investigated. Students cannot receive credit for this course and PHIL 114.

Prerequisite: Enrollment is restricted to graduate students.

PHIL 222 - Metaphysics (5)

Advanced introduction to topics in 20th century and contemporary analytic metaphysics. Divided into five main parts dealing, respectively, with issues about the nature of existence, properties, time, change and persistence, and material constitution.

Prerequisite: Enrollment is restricted to philosophy graduate students.

PHIL 224 - Philosophy of Language (5)

Advanced introduction to issues in the philosophy of language—primarily concerning the nature of reference, meaning, and truth. Works from such 20th-century figures as Russell, Wittgenstein, Kripke, Lewis, and Putnam discussed. Topics include what it is for a sign or a bit of language to be meaningful, or for it to identify or represent something; what it is for a statement to be truthful; what it is to be a language; and how reference works when attributed to beliefs.

Prerequisite: Enrollment is restricted to philosophy graduate students.

PHIL 231 - Epistemology (5)

May focus on topics such as naturalized epistemology, probabilistic epistemology, theories of justification, a priori knowledge, memory, and virtue epistemology.

Prerequisite: Enrollment is restricted to philosophy graduate students.

PHIL 232 - Advanced Topics in Value Theory (5)

Considers topics central to philosophical questions about value: ethics, normativity, practical reason, relativism, skepticism, responsibility, motivation, emotion, and so forth. In some instances, the investigation will proceed through influential historical figures, ancient to modern.

Prerequisite: Enrollment is restricted to philosophy graduate students.

PHIL 233 - Seminar in Philosophy of Mind (5)

A study of one or more topics in contemporary philosophy of mind.

Prerequisite: Enrollment is restricted to graduate students.

PHIL 235 - Philosophy of Psychology (5)

Looks at philosophical issues raised by current research on the nature of perception, cognition, and consciousness in psychology and cognitive science or neuroscience. Can there be a science of the mind? Could machines be conscious? Do animals have minds? How did the mind evolve? These and a host of related questions form the subject matter of this course.

Prerequisite: Prerequisite(s): One course in philosophy, psychology, or linguistics. Enrollment is restricted to graduate students.

PHIL 237 - Making Up the Mind (5)

How does the mind come to be a thing which science can study? Readings focus on how diagnostic categories, for example, multiple personality disorder, attain scientific cachet and what issues surround the medicalization of the mind.

Prerequisite: Enrollment is restricted to graduate students.

PHIL 239 - Philosophy of Religion (5)

Investigation of various topics in philosophy of religion.

Prerequisite: Enrollment is restricted to philosophy graduate students or by permission of instructor.

PHIL 246 - Ethics, Nature, and Natural Selection (5)

Explores the role, if any, that Darwinian theory and evolutionary biology should have on ethical theory. Topics range from classic work, including Darwin and classic expositors, to influential contemporary work on natural selection, in light of the best philosophical literature.

Prerequisite: Enrollment is restricted to graduate students.

PHIL 270 - Research Seminar (5)

A research seminar to develop the skills of the profession with special focus on critical reading, constructing feedback, and philosophical research and writing. Enrollment is restricted to third-year Ph.D. students, and students must complete it by the end of their third year.

Prerequisite: Enrollment is restricted to philosophy graduate students. Other students may enroll with instructor permission.

PHIL 280 - Graduate Colloquia Course (2)

This colloquia series sponsors speakers each quarter. Students must attend all colloquia and are encouraged to form discussion groups after each lecture.

Prerequisite: Enrollment is restricted to philosophy graduate students.

PHIL 281 - The Pedagogy of Philosophy (2)

Provides training for graduate students in university-level pedagogy in general and in the pedagogy of philosophy specially, under the supervision of a faculty member.

Prerequisite: Enrollment is restricted to graduate students.

PHIL 290A - Philosophy of History (5)

Examines issues that arise with respect to constructing histories. Inter alia, these include: the traditional philosophy of history (e.g., Hegel and Marx); modes of explanation (including narrative); the reality of the past; and underdetermination in history.

Prerequisite: Enrollment is restricted to graduate students.

PHIL 290C - Advanced Topics in Ethics (5)

Topics vary but the course focuses on major questions in contemporary ethical theory, or figures influential on contemporary moral philosophy. Examines different foundational ethical principles and arguments for those principles, contrasting accounts of moral action and moral motivation, as well as the epistemological and motivational role of emotions in ethical theory.

Prerequisite: Enrollment is restricted to philosophy graduate students.

PHIL 290F - Topics in Philosophy of Biology (5)

Philosophy of biology is one of the fastest-growing areas of philosophy of science. Course is designed to give seniors and graduate students an overview of many of the diverse topics currently under discussion in modern philosophy of biology and provide a foundation for further research, regardless of previous experience with the biological sciences.

Prerequisite: Enrollment is restricted to graduate students.

PHIL 290H - Environmental Ethics (5)

What is our proper moral stance toward the natural environment? This question encompasses our ethical relations to individual non-human animals, to other species of living beings, and toward the biotic community as a whole. It leads us to consider the broader question: What makes anything at all worthy of our moral respect or even our moral consideration? How are we to understand the very idea of the environment, the distinction between the human world, and the natural world, and the relationships between them.

Prerequisite: Enrollment is restricted to graduate students.

PHIL 290J - Advanced Topics in the History of Ethics (5)

Careful study of any one of the main moral theories in the history of philosophy, with some emphasis on the relation to contemporary moral philosophy.

Prerequisite: Enrollment is restricted to graduate students.

PHIL 290K - Philosophical Matters of Scientific Practice (5)

Considers the relevance of philosophical matters to the practice of science. Using quantum physics as a case study, explores historical and contemporary perspectives on issues such as those raised by the Schrodinger cat paradox, Bell's inequalities, and quantum erasers.

Prerequisite: Enrollment is restricted to graduate students.

PHIL 290O - Majors Figures in the History of Philosophy (5)

Focuses on philosophical writings and significance of a single major figure in the history of philosophy, ancient, medieval, or modern.

Prerequisite: Enrollment is restricted to philosophy graduate students.

PHIL 290P - Major Figures in Contemporary Philosophy (5)

Focuses on philosophical writings and significance of a single figure in contemporary (20th- and 21st-century) philosophy. May include, but not be limited to, Russell, Whitehead, Wittgenstein, Husserl, Carnap, Murdoch, Quine, Irigaray, Derrida, and Davidson.

Prerequisite: Enrollment is restricted to philosophy graduate students.

PHIL 290Q - Philosophy of Mathematics (5)

Introduction to the problems of contemporary analytic philosophy of mathematics. Do mathematical objects exist? Are mathematical statements true? How can we know? We will examine the historical background to contemporary debates and the positions which have been taken within them.

Prerequisite: Enrollment is restricted to graduate students.

PHIL 290S - Topics in the Philosophy of Science (5)

An examination of a topic in current philosophy of science. The material for the course is chosen from topics such as realism and instrumentalism, scientific explanation, space and time, the confirmation of theories, laws of nature, and scientific abstraction.

Prerequisite: Enrollment is restricted to graduate students.

PHIL 290W - History of Consciousness (5)

Historical study of philosophical theories of consciousness and self-consciousness. Problems include the relation of self and other, consciousness and body, and self-consciousness and ethical agency. Readings are from Kant, Hegel, Nietzsche, and Heidegger, followed by phenomenologists, poststructuralists, and analytic philosophy.

Prerequisite: Enrollment is restricted to graduate students.

PHIL 294 - Teaching-Related Independent Study (5)

Directed graduate research and writing coordinated with the teaching of undergraduates.

PHIL 295 - Directed Reading (5)

Directed reading which does not involve a term paper.

PHIL 295F - Readings in Philosophy (2)

Focuses on selected philosophical areas and/or specific philosophers. Students meet with the instructor to discuss readings and deepen their knowledge on a particular subject. Enrollment restricted to graduate students.

PHIL 296 - Special Student Seminar (5)

A seminar for graduate students arranged between students and a faculty member. Students submit petition to sponsoring agency.

PHIL 297 - Independent Study (5)

Students submit petition to sponsoring agency.

PHIL 297F - Independent Study (2)

Students submit petition to course sponsoring agency. Enrollment restricted to graduate students.

PHIL 299 - Thesis Research (5)

Enrollment restricted to students who have advanced to candidacy.

PHYE - PHYSICAL EDUCATION**Lower-Division****PHYE 5A - Aquatics: Non-Swimmer Swimming Level I (0)**

Coeducational. Water exploration and primary skills development. Course is designed to teach only non-swimmers how to swim. The following is taught: Red Cross swimming instruction in overcoming fears, water adjustment, floating, breath holding, and rhythmic breathing. Skills to be learned are: water entries, sculling, treading, elementary backstroke, freestyle, methods of water safety, and survival techniques. Prerequisite(s): instructor determines skill level at first class meeting.

PHYE 5B - Aquatics: Swimming Level I (0)

Coeducational. Primary skills development. Course is designed to teach "non-swimmers" how to swim better. The following is taught: Red Cross swimming instruction in overcoming fears, water adjustment, floating, breath holding, and rhythmic breathing. Skills to be learned are: water entries, sculling, treading, elementary backstroke, freestyle, methods of water safety, and survival techniques. Prerequisite(s): instructor determines skill level at first class meeting.

PHYE 5C - Aquatics: Swimming Level II (0)

Coeducational. Stroke readiness and development. Course is for those who have completed Swimming Level I or who can swim freestyle and demonstrate elementary backstroke. Skills to be learned are underwater swimming, turns, improvement of freestyle and elementary backstroke, beginning side stroke, backstroke, breaststroke, diving, personal safety skills, and

basic rescue techniques. Prerequisite(s): instructor determines skill level at first class meeting, which involves passing Swimming Level I course or demonstrating equivalent skills.

PHYE 5E - Aquatics: Lifeguard Training (LT) (0)

Red Cross certified lifeguard training. Provides the necessary minimum skills training to qualify as a non-surf lifeguard. Certification includes CPR Pro, AED, PDT, D2, ADMIN, and Title 22 First Aid. Candidates must successfully pass final skill tests and a written final exam with 80 percent score. Prerequisite(s): must have ability to swim 500 yards in ten minutes, tread water for one minute, strong swimming skills in free, back, breast, side, and elementary backstroke; must purchase Red Cross LT textbook.

PHYE 5G - Aquatics: Swimming/Conditioning (0)

Open to all students who wish to explore swimming as a conditioning and fitness exercise. Students should know three competitive strokes, and should be able to swim fifteen minutes without stopping. Short health and fitness lectures precede some classes. Prerequisite(s): instructor determination at first class meeting.

PHYE 5R - Aquatics: Basic Scuba Diving (0)

Coeducational. Sections geared toward the successful completion of NAUI Scuba Diver Certification. The course is divided into three parts: lecture, pool lab, and open water experience. Four open water training dives are offered. Emphasis is on training for open water scuba diving, using the beach as a base of operation. Prerequisite(s): pass swimming skills tests and medical clearance. It is strongly recommended that students enroll in PHYE 5S.

PHYE 5S - Aquatics: Advanced Scuba Diving (0)

Coeducational. Sections are offered to facilitate the development of the basic scuba diver's open water techniques. A minimum of six open water experiences is offered. Course is geared toward successful completion of NAUI Advanced Scuba Diver Certification. Prerequisite(s): PHYE 5R or pass swimming skills test and medical clearance.

PHYE 5T - Scuba Rescue Diving (0)

Coeducational. Course geared toward the successful completion of NAUI Rescue Diver Certification. Course consists of lectures, pool laboratory, and open-water experience. Emphasis is on training divers to manage risks and effectively handle limited in-water problems. Prerequisite(s): Scuba certification and medical clearance.

PHYE 9B - Boating: Beginning Dinghy Sailing (0)

Coeducational. Introductory course in practical boating safety using 15-foot sailboats. Includes introduction to rigging, nomenclature, seamanship, proper boat-handling techniques, and general boating and aquatic safety. Satisfactory completion meets prerequisites for intermediate-level dinghy course. Prerequisite(s): swimming ability.

PHYE 9C - Boating: Intermediate Dinghy Sailing (0)

Coeducational. Course includes a review of basic sailing with an emphasis on the further development and refinement of small-boat sailing techniques. Fifteen-foot sailboats are used with two students per boat.

Prerequisite: Prerequisite(s): PHYE 9B or equivalent skills.

PHYE 9H - Boating: Basic Rowing (0)

Coeducational. Course designed to cover types of rowing boats, nomenclature, fundamental skills, and specific safety and rescue aspects related to the activity. Students will row singly as well as in groups using 15-foot to 22-foot rowing dories. Prerequisite(s): swimming ability.

PHYE 9K - Boating: Ocean Kayaking (0)

Co-educational course that teaches novice kayakers the skills to safely use UCSC kayaks in Monterey Bay. Topics include: basic paddling strokes and maneuvers; self and assisted deep-water rescues; beach launching; landing through surf; and marine hazards and navigation.

PHYE 9S - Boating: Beginning Keelboat Sailing (0)

Coeducational. Combines hands-on rigging and docking practice in the harbor and sailing practice on Monterey Bay with instruction in sail-trimming, de-powering, powering-up, person-overboard recovery techniques, boating safety, weather, ocean conditions, sailing theory, rigging, navigation, and the maritime rules of the road. Twenty-seven foot, ultralight, displacement keelboats are used.

Prerequisite: Prerequisite(s): PHYE 9C or equivalent skills.

PHYE 9T - Boating: Intermediate Keelboat Sailing (0)

Coeducational. Further development and refinement of boat-handling techniques, including advanced maneuvering, anchoring, and racing with an introduction to the use of spinnakers.

Prerequisite: Prerequisite(s): PHYE 9S.

PHYE 15B - Court Sports: Basketball (0)

Coeducational. Introductory course providing instruction in fundamentals, offensive and defensive strategies, rules, and conditioning designed primarily for beginning and intermediate level players.

PHYE 15N - Court Sports: Tennis (0)

Coeducational. Introductory course introducing the basics of forehand, backhand, and serve and introduces the volley, overhead, and lob.

PHYE 15S - Court Sports: Sand Volleyball (0)

Coeducational. Introductory course offered for students who desire to learn and improve the basic skills, as well as to understand the rules.

PHYE 15T - Court Sports: Volleyball (0)

Coeducational. Introductory course for students who desire to learn and improve the basic skills, as well as to understand the rules.

PHYE 20A - Dance: Ballet (0)

Coeducational. Introductory course with emphasis on principles of movement, style, and execution of ballet technique.

PHYE 20C - Dance: Jazz (0)

Coeducational. Introductory course of jazz dance emphasizing basic technique, styling, rhythm, and isolations.

PHYE 20D - Dance: Modern (0)

Coeducational. Introductory course with an emphasis on basic techniques and building phrases of movement.

PHYE 25A - Fencing: Epee (0)

Coeducational. Basic instruction in the techniques, strategy, and general methodology of modern fencing. Emphasis on épée fencing as a development from the traditional French and Italian dueling sword styles as they have evolved to form the modern electrical game.

PHYE 28K - Field Sports: Soccer (0)

Coeducational. Sections are offered in field soccer and indoor soccer. Instruction in the basic techniques, tactics, laws of the game, and injury prevention for players of all levels. Prerequisite(s): determination at first class meeting.

PHYE 30J - Fitness Activities: Strength Training (0)

Coeducational. Introduction to safe and effective methods of weight training and other personal conditioning activities. Topics covered include proper weight-training techniques, care of body and equipment, and elementary exercise physiology.

PHYE 30L - Fitness Activities: Yoga Exercises (0)

Coeducational. Offered at beginning levels of a variety of yoga exercises.

PHYE 43A - Martial Arts: Aikido I (0)

Coeducational. Introductory-level course in nonviolent, noncompetitive Japanese martial art emphasizing mind-body harmony, balance, relaxation, and the understanding of vital energy. Aikido self-defense techniques aim toward the creative resolution of conflict and the growth of the individual.

PHYE 43B - Martial Arts: Aikido II (0)

Coeducational. Intermediate-level course in nonviolent, noncompetitive Japanese martial art emphasizing mind-body harmony, balance, relaxation, and the understanding of vital energy. Aikido self-defense techniques aim toward the creative resolution of conflict and the growth of the individual.

Graduate**PHYE 209B - Boating: Graduate Beginning Dinghy Sailing (0)**

Coeducational. Introductory course in practical boating safety using 15-foot sailboats. Includes introduction to rigging, nomenclature, seamanship, proper boat-handling techniques, and general boating and aquatic safety. Satisfactory completion meets prerequisites for intermediate-level dinghy course.

Prerequisite: Prerequisite(s): swimming ability. Enrollment is restricted to graduate students.

PHYE 209C - Boating: Graduate Intermediate Dinghy Sailing (0)

Coeducational. Course includes a review of basic sailing with an emphasis on the further development and refinement of small-boat sailing techniques. Fifteen-foot sailboats are used with two students per boat.

Prerequisite: Prerequisite(s): PHYE 9B or PHYE 209B, or equivalent skills; and swimming ability. Enrollment is restricted to graduate students.

PHYE 209S - Boating: Grad Student Beginning Keelboat Sailing (0)

Coeducational. Combines hands-on rigging and docking practice in the harbor and sailing practice on Monterey Bay with instruction in sail-trimming, de-powering, powering-up, person-overboard recovery techniques, boating safety, weather, ocean conditions, sailing theory, rigging, navigation, and the maritime rules of the road. Twenty-seven foot, ultralight, displacement keelboats are used.

Prerequisite: Prerequisite(s): PHYE 9C or PHYE 209C. Enrollment is restricted to graduate students.

PHYS - PHYSICS**Lower-Division****PHYS 1 - Physics for Everyone (5)**

Explores some of the great topics in classical and modern physics, including quantum mechanics and relativity, and the connections to a broad range of inquiry, from daily life to cosmology. Math, mainly algebra, is used in a way that is completely accessible to everyone. (Formerly Conceptual Physics).

PHYS 2 - Elementary Physics of Energy (5)

The physics of energy developed in a course accessible to non-science majors as well as science majors. Fundamental principles and elementary calculations, at the level of basic algebra, developed and applied to the understanding of the physics of energy. Topics include fossil fuels, renewable energy, solar cells and waste energy, waste-energy recovery, nuclear power, and global greenhouse effects.

PHYS 5A - Introduction to Physics I (5)

Elementary mechanics. Vectors, Newton's laws, inverse square force laws, work and energy, conservation of momentum and energy, and oscillations.

Prerequisite: Prerequisite(s): MATH 19A or MATH 20A; concurrent enrollment in PHYS 5L is required.

PHYS 5B - Introduction to Physics II (5)

A continuation of PHYS 5A. Wave motion in matter, including sound waves. Geometrical optics, interference and polarization, statics and dynamics of fluids.

Prerequisite: Prerequisite(s): PHYS 5A and PHYS 5L and MATH 19A or MATH 20A; concurrent enrollment in PHYS 5M is required. Corequisite: MATH 19B or MATH 20B.

PHYS 5C - Introduction to Physics III (5)

Introduction to electricity and magnetism. Electromagnetic radiation, Maxwell's equations.

Prerequisite: Prerequisite(s): PHYS 5A and PHYS 5L and MATH 19B or MATH 20B. Concurrent enrollment in PHYS 5N is required.

PHYS 5D - Introduction to Physics IV (5)

Introduces temperature, heat, thermal conductivity, diffusion, ideal gases, laws of thermodynamics, heat engines, and kinetic theory. Introduces the special theory of relativity and the equivalence principle. Includes the photoelectric effect, the Compton effect, matter waves, atomic spectra, and the Bohr model.

Prerequisite: Prerequisite(s): PHYS 5A and PHYS 5L, or PHYS 6A and PHYS 6L; and PHYS 5B or PHYS 6B; and MATH 19B or MATH 20B.

PHYS 5L - Introduction to Physics I Laboratory (1)

Laboratory sequence illustrating topics covered in PHYS 5A. One three-hour laboratory session per week.

Prerequisite: Prerequisite(s): concurrent enrollment in PHYS 5A is required.

PHYS 5M - Introduction to Physics II Laboratory (1)

Laboratory sequence illustrating topics covered in PHYS 5B. One three-hour laboratory session per week.

Prerequisite: Prerequisite(s): PHYS 5A and PHYS 5L; concurrent enrollment in PHYS 5B is required.

PHYS 5N - Introduction to Physics Laboratory III (1)

Laboratory sequence illustrating topics covered in PHYS 5C. One three-hour laboratory session per week.

Prerequisite: Prerequisite(s): PHYS 5A and PHYS 5L. Concurrent enrollment in PHYS 5C is required.

PHYS 6A - Introductory Physics I (5)

Elementary mechanics. Vectors, Newton's laws, inverse square force laws, work and energy, conservation of momentum and energy, and oscillations.

Prerequisite: Prerequisite(s): MATH 11A or MATH 19A or MATH 20A or AM 15A. Concurrent enrollment in PHYS 6L is required.

PHYS 6B - Introductory Physics II (5)

A continuation of PHYS 6A. Geometric optics; statics and dynamics of fluids; introduction to thermodynamics, including temperature, heat, thermal conductivity, and molecular motion; wave motion in matter, including sound waves.

Prerequisite: Prerequisite(s): PHYS 5A and PHYS 5L or PHYS 6A and PHYS 6L; and MATH 11B or MATH 19B or MATH 20B or AM 15B.

PHYS 6C - Introductory Physics III (5)

Introduction to electricity and magnetism. Elementary circuits; Maxwell's equations; electromagnetic radiation; interference and polarization of light.

Prerequisite: Prerequisite(s): PHYS 5A and PHYS 5L or PHYS 6A and PHYS 6L, and MATH 11B or MATH 19B or MATH 20B or AM 15B.

PHYS 6L - Introductory Physics I Laboratory (1)

Laboratory sequence illustrating topics covered in PHYS 6A. One three-hour laboratory session per week.

Prerequisite: Prerequisite(s): Previous or concurrent enrollment in PHYS 6A or PHYS 7A is required.

PHYS 6M - Introductory Physics II Laboratory (1)

Laboratory sequence illustrating topics covered in PHYS 6B. One three-hour laboratory session per week.

Prerequisite: Prerequisite(s): PHYS 5A, PHYS 6A, or PHYS 7A; and PHYS 5L, PHYS 6L or PHYS 7L; and previous or concurrent enrollment in PHYS 6B.

PHYS 6N - Introductory Physics III Laboratory (1)

Laboratory sequence illustrating topics covered in PHYS 6C. One three-hour laboratory session per week.

Prerequisite: Prerequisite(s): PHYS 6A and PHYS 6L or PHYS 5A and PHYS 5L; previous or concurrent enrollment in PHYS 6C; PHYS 6B and PHYS 6M are recommended.

PHYS 7A - Elementary Physics I (5)

Examines elementary mechanics, including vectors, kinematics, Newton's laws, work and energy, conservation of momentum and energy, fluid motion, and temperature and heat.

Prerequisite: Prerequisite(s): MATH 11A or MATH 19A or MATH 20A or AM 15A. Concurrent enrollment in PHYS 6L or PHYS 7L is required.

PHYS 7B - Elementary Physics II (5)

Examines elementary wave motion, light polarization, reflection and refraction; elementary electricity, including electric charge, Coulomb's Law, and electric field and potential; electrostatic energy, currents, conductors, resistance, and Ohm's Law; and magnetic fields, inductors, and circuits.

Prerequisite: Prerequisite(s): PHYS 7A, and MATH 11B, or MATH 19B, or MATH 20B, or AM 15B.

PHYS 7L - Elementary Physics Laboratory (1)

Laboratory sequence illustrating topics covered in PHYS 7A. One three-hour laboratory session per week.

Prerequisite: Prerequisite(s): Concurrent enrollment in PHYS 7A is required.

PHYS 11 - The Physicist in Industry (2)

One two-hour meeting per week. Subjects include roles of the physicist in industry, the business environment in a technical company, economic considerations, job hunting, and discussions with physicists with industrial experience. Enrollment by permission of instructor. Priority given to applied physics upper-division students; other majors if space available.

PHYS 80U - Physics and Psychophysics of Music (5)

Fundamental theory of vibration, sound waves, sound propagation, diffraction, and interference. Free, coupled, and driven oscillations. Resonance phenomena and modes of oscillation. Fourier's theorem. Anatomy and psychophysics of the ear. Musical scales and intervals. Nature of plucked and bowed strings; guitar, violin, piano. Woodwind and brass instruments. Architectural acoustics. High school algebra and basic knowledge of musical notation recommended.

PHYS 99 - Tutorial (5)

Students submit petition to sponsoring agency.

Upper-Division

PHYS 102 - Modern Physics (5)

Topics in quantum physics including the Schrodinger equation; angular momentum and spin; the Pauli exclusion principle; and quantum statistics. Applications in multi-electron atoms and molecules, and in solid-state, nuclear, and particle physics.

Prerequisite: Prerequisite(s): PHYS 5A, PHYS 5L, PHYS 5B, PHYS 5M, PHYS 5C, PHYS 5N and PHYS 5D; or PHYS 6A, PHYS 6L, PHYS 6B, PHYS 6M, PHYS 6C, PHYS 6N, and PHYS 5D; or equivalent.

PHYS 105 - Mechanics (5)

Particle dynamics in one, two, and three dimensions. Conservation laws. Small oscillations, Fourier series and

Fourier integral solutions. Phase diagrams and nonlinear motions, Lagrange's equations, and Hamiltonian dynamics.

Prerequisite: Prerequisite(s): PHYS 5A and PHYS 5L; and PHYS 116A or MATH 21 plus MATH 24. Concurrent enrollment in PHYS 116C or MATH 107 is required.

PHYS 110A - Electricity, Magnetism, and Optics (5)

Examines electrostatics, including the electric field, potential, solutions to Laplace's and Poisson's equations, and work and energy; electricity in matter (conductors, dielectrics); magnetostatics, including the magnetic field and vector potential, Ampere's and Faraday's laws; magnetism in matter; and Maxwell's equations.

Prerequisite: Prerequisite(s): PHYS 5C; and PHYS 116A or MATH 21 and MATH 24; and PHYS 116C or MATH 107.

PHYS 110B - Electricity, Magnetism, and Optics (5)

Examines electromagnetic waves, including absorption and dispersion, reflection and transmission, and wave guides; conservation laws and gauge invariance; time-dependent vector and scalar potentials and application to radiation of charges and antennae; and electrodynamics and relativity.

Prerequisite: Prerequisite(s): PHYS 110A; and PHYS 116C or MATH 107.

PHYS 112 - Thermodynamics and Statistical Mechanics (5)

Consequences of the first and second laws of thermodynamics, elementary statistical mechanics, thermodynamics of irreversible processes.

Prerequisite: Prerequisite(s): PHYS 5D and MATH 23B. Concurrent enrollment in PHYS 102 is required.

PHYS 115 - Computational Physics (5)

This course applies efficient numerical methods to the solutions of problems in the physical sciences which are otherwise intractable. Examples will be drawn from classical mechanics, quantum mechanics, statistical mechanics, and electrodynamics. Students apply a high-level programming language, such as Python, to the solution of physical problems and develop appropriate error and stability estimates.

Prerequisite: Prerequisite(s): PHYS 102 and PHYS 105; and PHYS 116A or MATH 21 and MATH 24; and PHYS 116C or MATH 107, or equivalent. Basic programming experience in Python or similar language.

PHYS 116A - Mathematical Methods in Physics (5)

Infinite series, topics in linear algebra including vector spaces, matrices and determinants, systems of linear equations, eigenvalue problems and matrix diagonalization, tensor algebra, and ordinary differential equations.

Prerequisite: Prerequisite(s): MATH 23A.

PHYS 116B - Mathematical Methods in Physics (5)

Complex functions, complex analysis, asymptotic series and expansions, special functions defined by integrals, calculus of variations, and probability, and statistics.

Prerequisite: Prerequisite(s): PHYS 116A or MATH 21 and MATH 24; and MATH 23A; and concurrent enrollment in MATH 23B.

PHYS 116C - Mathematical Methods in Physics (5)

Fourier series and transforms, Dirac-delta function, Green's functions, series solutions of ordinary equations, Legendre polynomials, Bessel functions, sets of orthogonal functions, and partial differential equations.

Prerequisite: Prerequisite(s): PHYS 116A or MATH 21 and MATH 24; and PHYS 116B and MATH 23A and MATH 23B.

PHYS 120 - Polymer Physics (5)

Statistical properties polymers; scaling behavior, fractal dimensions; random walks, self avoidance; single chains and concentrated solutions; dynamics and topological effects in melts; polymer networks; sol-gel transitions; polymer blends; application to biological systems; computer simulations will demonstrate much of the above. Students cannot receive credit for this course and PHYS 240.

Prerequisite: Prerequisite(s): PHYS 112.

PHYS 129 - Particle Physics and Astrophysics (5)

The standard model of particle physics; physics beyond the standard model; neutrino physics; the early universe; dark matter and dark energy; selected topics in general relativistic cosmology and high-energy astrophysics. (Formerly Nuclear and Particle Astrophysics.)

Prerequisite: Prerequisite(s): PHYS 5D, PHYS 102, and MATH 23B; and PHYS 116A or MATH 21. Students with equivalent coursework may contact instructor for permission to enroll.

PHYS 133 - Intermediate Laboratory (5)

Demonstration of phenomena of classical and modern physics. Development of a familiarity with experimental methods. Special experimental projects may be undertaken by students in this laboratory.

Prerequisite: Prerequisite(s): PHYS 5C and PHYS 5D and one from CSE 5J, or CSE 14, or CSE 20, or ASTR 119, or by permission of the instructor. Enrollment is restricted to physics, applied physics, physics (astrophysics), and science education majors and physics minors.

PHYS 134 - Physics Advanced Laboratory (5)

Individual experimental investigations of basic phenomena in atomic, nuclear, and solid state physics.

Prerequisite: Prerequisite(s): PHYS 133 and PHYS 102.

PHYS 135 - Astrophysics Advanced Laboratory (5)

Introduction to the techniques of modern observational astrophysics at optical and radio wavelengths through hands-on experiments. Offered in some academic years as a multiple-term course: PHYS 135A in fall and PHYS 135B in winter, depending on astronomical conditions.

Prerequisite: Prerequisite(s): PHYS 133 and at least one astronomy course. Enrollment is restricted to physics (astrophysics) majors. Intended primarily for juniors and seniors majoring or minoring in astrophysics.

PHYS 135A - Astrophysics Advanced Laboratory (3)

Introduction to techniques of modern observational astrophysics at optical and radio wavelengths through hands-on experiments. Intended primarily for juniors and seniors majoring or minoring in astrophysics. Offered in some academic years as single-term course PHYS 135 in fall, depending on astronomical conditions.

Prerequisite: Prerequisite(s): PHYS 133 and at least one astronomy course. Enrollment is restricted to physics (astrophysics) majors.

PHYS 135B - Astrophysics Advanced Laboratory (2)

Introduction to techniques of modern observational astrophysics at optical and radio wavelengths through hands-on experiments. Intended primarily for juniors and seniors majoring or minoring in astrophysics. Offered in some academic years as single-term course PHYS 135 in fall, depending on astronomical conditions.

Prerequisite: Prerequisite(s): PHYS 135A. Enrollment is restricted to physics (astrophysics) majors.

PHYS 137 - Advanced Optics Laboratory (5)

Application of advanced optical techniques to the study of problems in astrophysics, physics, chemistry, biology, and engineering. Techniques include interferometry, Fourier optics, adaptive optics, optical tweezers, photon correlation spectroscopy, optical pumping, laser spectroscopy, and more.

Prerequisite: Prerequisite(s): PHYS 102 or ECE 102; and PHYS 133 or by permission of instructor.

PHYS 139A - Quantum Mechanics I (5)

Basic principles and mathematical techniques of nonrelativistic quantum mechanics: Schrodinger equation and Dirac notation; one-dimensional systems, including the free particle and harmonic oscillator; three-dimensional problems with spherical symmetry; angular momentum; hydrogen atom; spin; identical particles and degenerate gases.

Prerequisite: Prerequisite(s): PHYS 102; and PHYS 116A or MATH 21 and MATH 24; and PHYS 116C or MATH 107.

PHYS 139B - Quantum Mechanics II (5)

Approximation methods in nonrelativistic quantum mechanics: time-independent perturbation theory (non-degenerate and degenerate) and addition of angular momenta; variational

methods; the WKB approximation; time-dependent perturbation theory and radiation theory; scattering theory.

Prerequisite: Prerequisite(s): PHYS 102; and PHYS 116A or MATH 21 and MATH 24; and PHYS 116C or MATH 107; and PHYS 139A.

PHYS 150 - Quantum Computing (5)

Basic concepts in quantum mechanics including quantum states, measurements, operators, entanglement, entanglement entropy, "no cloning" theorem, and density matrices. Classical gates, reversible computing, quantum gates. Several quantum algorithms including Deutsch's algorithm, Simon's algorithm, Shor's algorithm and the Grover algorithm. Quantum error correction. Adiabatic quantum computing.

Prerequisite: PHYS 5A; and PHYS 116A or MATH 21 or AM 10.

PHYS 152 - Neural Networks, Statistical Physics and Computing (5)

Review of select topics in statistical physics including information theory, entropy, coupled systems, phase transitions, and symmetry breaking. Introduction to multivariate algorithms, with an emphasis on their foundations in statistical physics and classical mechanics. Notebooks, data preparation, cross-validation, supervised and unsupervised learning. Practical considerations for training and optimizing neural networks and related tools.

Prerequisite: Prerequisite(s): PHYS 105 and PHYS 112; and CSE 20 or ASTR 119 or PHYS 115 or prior programming experience with permission of instructor.

PHYS 155 - Solid State Physics (5)

Interatomic forces and crystal structure, diffraction, lattice vibrations, free electron model, energy bands, semiconductor theory and devices, optical properties, magnetism, magnetic resonance, superconductivity.

Prerequisite: Prerequisite(s): PHYS 112 and PHYS 139A; students with equivalent coursework may contact instructor for permission to enroll.

PHYS 156 - Applications of Solid State Physics (5)

Emphasizes the application of condensed matter physics to a variety of situations. Examples chosen from subfields such as semiconductor physics, lasers, superconductivity, low temperature physics, magnetism, and defects in crystals.

Prerequisite: Prerequisite(s): PHYS 102.

PHYS 160 - Practical Electronics (5)

Provides a practical knowledge of electronics that experimentalists generally need in research. The course assumes no previous knowledge of electronics and progresses according to the interest and ability of the class. Based on weekly lectures. However, with the aid of the instructor, the students are expected to learn mainly through the design, construction, and debugging of electronics projects. Students are billed a materials fee.

Prerequisite: Prerequisite(s): PHYS 5C and PHYS 5N or PHYS 6C and PHYS 6N.

PHYS 171 - General Relativity, Black Holes, and Cosmology (5)

Special relativity is reviewed. Curved space-time, including the metric and geodesics, are illustrated with simple examples. The Einstein equations are solved for cases of high symmetry. Black-hole physics and cosmology are discussed, including recent developments.

Prerequisite: Prerequisite(s): PHYS 105, PHYS 110A, and PHYS 110B; and PHYS 116A or MATH 21 and MATH 24.

PHYS 180 - Biophysics (5)

Physical principles and techniques used in biology: X-ray diffraction; nuclear magnetic resonance; statistics, kinetics, and thermodynamics of macromolecules; viscosity and diffusion; DNA/RNA pairing; electrophoresis; physics of enzymes; biological energy conversion; optical tweezers.

Prerequisite: Prerequisite(s): PHYS 112; students who have a biochemistry background may contact instructor for permission. Restricted to juniors and seniors.

PHYS 182 - Scientific Communication for Physicists (5)

Develops the writing skills necessary to prepare professional publications: how to structure a physics article; write for a specific audience with clarity, precision, and concision; and deliver a short informal presentation. Additionally, students become familiar with the peer review process and the ethics of the publication process.

Prerequisite: Prerequisite(s): PHYS 133 and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to junior and senior majors in physics, astrophysics, applied physics, or physics education.

PHYS 191 - Teaching Practicum (5)

Designed to provide upper-division undergraduates with an opportunity to work with students in lower division courses, leading discussions, reading and marking submissions, and assisting in the planning and teaching of a course. Prerequisite(s): excellent performance in major courses; instructor approval required; enrollment restricted to senior physics majors.

PHYS 192 - Directed Student Teaching (5)

Teaching of a lower-division seminar under faculty supervision. (See PHYS 42.) Prerequisite(s): upper-division standing; submission of a proposal supported by a faculty member willing to supervise.

PHYS 195A - Senior Thesis I (5)

Independent research for seniors conducted under the supervision of a faculty mentor. Students develop a written research proposal, thesis outline, and introductory material. Prerequisite(s): Entry Level Writing and Composition requirements. Enrollment is restricted to senior applied physics, physics, and physics (astrophysics) majors.

PHYS 195B - Senior Thesis II (5)

Independent research for seniors conducted under the supervision of a faculty mentor. Students prepare an oral presentation of their results, and they submit a written senior thesis on their research topic. Prerequisite(s): Entry Level Writing and Composition requirements. Enrollment is restricted to senior applied physics, physics, and physics (astrophysics) majors.

PHYS 199 - Tutorial (5)

Students submit petition to sponsoring agency.

PHYS 199F - Tutorial (2)

Tutorial

Graduate**PHYS 202 - Introduction to Teaching in Physics (1)**

A practical introduction to working as a teaching assistant for undergraduate classes in physics, including both teaching laboratories and running discussion sections. The training includes topics in classroom climate and inclusivity, active learning, motivating students, office hours, information technology, grading, communication with the instructor, and handling difficult situations. Students engaged in teaching in the same quarter are encouraged to apply the lessons in their classes and return with feedback to be discussed. Required course for first year graduate students.

Prerequisite: Enrollment is restricted to graduate students.

PHYS 205 - Introduction to Research in Physics (2)

Introduction to current research opportunities at UCSC for graduate students. Topics include: elementary particle physics, condensed matter and solid state physics, high energy astrophysics, biophysics, and cosmology. Selected topics related to career development may also be included.

Prerequisite: Enrollment is restricted to graduate students or by permission of instructor.

PHYS 210 - Classical Mechanics and Thermal Physics (5)

Generalized coordinates, Lagrange and Hamiltonian mechanics, Poisson Brackets, Classical field theory, other advanced topics in classical dynamics. Introduction to thermodynamics, thermodynamic potentials and Legendre transforms, entropy, distribution functions. (Formerly Classical Mechanics.)

Prerequisite: Enrollment is restricted to graduate students only, except by permission of instructor.

PHYS 212 - Electromagnetism I (5)

Examines electrostatics and magnetostatics, boundary value problems, multipole expansion, dielectric and magnetic materials, time-varying electromagnetic fields, Maxwell's equations, conservation laws, and plane electromagnetic waves and wave propagation.

Prerequisite: Enrollment is restricted to graduate students only, except by permission of instructor.

PHYS 214 - Electromagnetism II (5)

Electromagnetic waves; waves in dispersive media; waveguides and cavities; complete development of special relativity with applications; Lorentz covariant formulation of Maxwell's equations; radiating systems; scattering and diffraction; advanced topics in radiation theory and optics.

Prerequisite: Prerequisite(s): PHYS 212. Enrollment is restricted to graduate students only, except by permission of instructor.

PHYS 215 - Introduction to Non-Relativistic Quantum Mechanics (5)

Mathematic introduction; fundamental postulates; time evolution operator, including the Heisenberg and Schrodinger pictures; simple harmonic oscillator and coherent states; one-dimensional scattering theory, including S-matrix resonant phenomena; two-state systems, including magnetic resonance; symmetries, including rotation group, spin, and the Wigner-Eckart theorem; rotationally invariant problems, including the hydrogen atom; gauge invariance, including Landau levels; introduction to path integral.

Prerequisite: Enrollment is restricted to graduate students only, except by permission of instructor.

PHYS 216 - Advanced Topics in Non-Relativistic Quantum Mechanics (5)

Approximate methods: time-independent perturbation theory, variational principle, time-dependent perturbation theory; three-dimensional scattering theory; identical particles; permutation symmetry and exchange degeneracy, anti-symmetric and symmetric states; many-body systems and self-consistent fields: variational calculations; second quantized formalism, including Fock spaces/number representation, field operators and Green functions; applications: electron gas; quantization of the electromagnetic field and interaction of radiation with matter: absorption, emission, scattering, photoelectric effect, and lifetimes.

Prerequisite: Prerequisite(s): PHYS 215. Enrollment is restricted to graduate students only, except by permission of instructor.

PHYS 217 - Quantum Field Theory I (5)

Lorentz invariance in quantum theory, Dirac and Klein-Gordon equations, the relativistic hydrogen atom, Green functions and canonical approach to field theory, quantum electrodynamics, Feynman diagrams for scattering processes, symmetries and Ward identities. Students learn to perform calculations of scattering and decay of particles in field theory.

Prerequisite: Prerequisite(s): PHYS 216 or exception by permission of the instructor. Enrollment is restricted to graduate students or by permission of the instructor.

PHYS 218 - Quantum Field Theory II (5)

Path integral approach to quantum field theory. Theory of renormalization and the renormalization group, introduction to gauge theories and spontaneously broken field theories. Applications to the standard model of strong, weak, and electromagnetic interactions.

Prerequisite: Prerequisite(s): PHYS 217. Enrollment is restricted to graduate students only, except by permission of instructor.

PHYS 219 - Statistical Physics (5)

The basic laws of thermodynamics, entropy, thermodynamic potentials, kinetic theory of gases, quantum and classical statistical mechanics, virial expansion, linear response theory. Applications in condensed matter physics.

Prerequisite: Enrollment is restricted to graduate students only, except by permission of instructor.

PHYS 220 - Theory of Many-Body Physics (5)

Finite temperature Green functions, Feynman diagrams, Dyson equation, linked cluster theorem, Kubo formula for electrical conductivity, electron gas, random phase approximation, Fermi surfaces, Landau fermi liquid theory, electron phonon coupling, Migdal's theorem, superconductivity.

Prerequisite: Prerequisite(s): PHYS 216 and PHYS 219. Enrollment is restricted to graduate students only, except by permission of instructor.

PHYS 221A - Introduction to Particle Physics I (5)

First quarter of a two-quarter graduate level introduction to particle physics, including the following topics: discrete symmetries, quark model, particle classification, masses and magnetic moments, passage of radiation through matter, detector technology, accelerator physics, Feynman calculus, and electron-positron annihilation.

Prerequisite: Prerequisite(s): PHYS 217 or concurrent enrollment. Enrollment is restricted to graduate students only, except by permission of instructor.

PHYS 221B - Introduction to Particle Physics II (5)

Second quarter of a two-quarter graduate level introduction to particle physics, including the following topics: nucleon structure, weak interactions and the Standard Model, neutrino oscillation, quantum chromodynamics, CP violation, and a tour of the Stanford Linear Accelerator Center.

Prerequisite: Prerequisite(s): PHYS 221A; PHYS 217 or concurrent enrollment. Enrollment is restricted to graduate students only, except by permission of instructor.

PHYS 222 - Quantum Field Theory III (5)

Focuses on the theoretical underpinnings of the standard model, including the spontaneous symmetry breaking, the renormalization group, the operator product expansion, and precision tests of the Standard Model.

Prerequisite: Prerequisite(s): PHYS 218 and PHYS 221B. Enrollment is restricted to graduate students only, except by permission of instructor.

PHYS 224 - Particle Astrophysics and Cosmology (5)

Particle physics and cosmology of the very early universe: thermodynamics and thermal history; out-of-equilibrium phenomena (e.g., WIMPs freeze-out, neutrino cosmology, Big Bang nucleosynthesis, recombination); baryogenesis; inflation; topological defects. High-energy astrophysical processes: overview of cosmic ray and gamma ray astrophysics; radiative and inelastic processes; astroparticle acceleration mechanisms; magnetic fields and cosmic ray transport; radiation-energy density of the universe; ultrahigh-energy cosmic rays; dark-matter models; and detection techniques.

Prerequisite: Enrollment is restricted to graduate students only, except by permission of instructor.

PHYS 226 - General Relativity (5)

Develops the formalism of Einstein's general relativity, including solar system tests, gravitational waves, cosmology, and black holes.

Prerequisite: Enrollment is restricted to graduate students only, except by permission of instructor.

PHYS 231 - Introduction to Condensed Matter Physics (5)

Crystal structures, reciprocal lattice, crystal bonding, phonons (including specific heat), band theory of electrons, free electron model, electron-electron and electron-phonon interactions, transport theory.

Prerequisite: Prerequisite(s): PHYS 216 or equivalent course or by permission of the instructor. Enrollment is restricted to graduate students only, or by permission of instructor.

PHYS 232 - Condensed Matter Physics (5)

Magnetism (para, ferro, anti-ferro, ferri), spin waves, superconductivity, introduction to semiconductors.

Prerequisite: Prerequisite(s): PHYS 231. Enrollment is restricted to graduate students only, except by permission of instructor.

PHYS 233 - Advanced Condensed Matter Physics (5)

A special topics course which includes areas of current interest in condensed matter physics. Possible topics include superconductivity, phase transitions, renormalization group, disordered systems, surface phenomena, magnetic resonance, and spectroscopy.

Prerequisite: Prerequisite(s): PHYS 231. Enrollment is restricted to graduate students only, except by permission of instructor.

PHYS 234 - Soft Condensed Matter Physics (5)

A selection of topics from: liquid crystals, biological systems, renormalization group and critical phenomena, stochastic processes, Langevin and Fokker Planck equations,

hydrodynamic theories, granular materials, glasses, quasicrystals.

Prerequisite: Prerequisite(s): PHYS 219 and PHYS 232.
Enrollment is restricted to graduate students.

PHYS 240 - Polymer Physics (5)

Statistical properties polymers. Scaling behavior, fractal dimensions. Random walks, self avoidance. Single chains and concentrated solutions. Dynamics and topological effects in melts. Polymer networks. Sol-gel transitions. Polymer blends. Application to biological systems. Computer simulations demonstrating much of the above. Students cannot receive credit for this course and PHYS 120.

Prerequisite: Enrollment is restricted to graduate students only, except by permission of instructor.

PHYS 242 - Computational Physics (5)

This course will apply efficient numerical methods to the solution of problems in the physical sciences which are otherwise intractable. Examples will be drawn from classical mechanics, quantum mechanics, statistical mechanics, and electrodynamics. Students will apply a high-level programming language such as Mathematica to the solution of physical problems and will develop appropriate error and stability estimates.

Prerequisite: Prerequisite(s): basic programming experience in C or Fortran. No previous experience with Mathematica is required. Enrollment is restricted to graduate students only, except by permission of instructor.

PHYS 251 - Group Theory and Modern Physics (5)

Finite and continuous groups, group representation theory, the symmetric group and Young tableaux, Lie groups and Lie algebras, irreducible representations of Lie algebras by tensor methods, unitary groups in particle physics, Dynkin diagrams, Lorentz and Poincaré groups.

Prerequisite: Enrollment is restricted to graduate students only, except by permission of instructor.

PHYS 290 - Special Topics (5)

A series of lectures on various topics of current interest in physics at UC Santa Cruz.

Prerequisite: Enrollment is restricted to graduate students only, except by permission of instructor.

PHYS 291A - Cosmology (2)

Intensive research seminar on cosmology and related topics in astrophysics: nature of dark matter; origin of cosmological inhomogeneities and other initial conditions of the big bang; origin and evolution of galaxies and large scale structure in the universe.

Prerequisite: Enrollment is restricted to graduate students only, except by permission of instructor.

PHYS 291B - X-rays and Magnetism (2)

Research seminar on x-ray studies of the properties and behavior of magnetic materials. Topics include: the underlying physical interactions, experimental techniques, and selected examples from current research. This course includes a visit to the Advanced Light Source in Berkeley.

Prerequisite: Enrollment is restricted to graduate students.

PHYS 291C - Developments in Theoretical Particle Physics (2)

Seminar on the current literature of elementary particle physics, ranging from strong and weak interaction phenomenology to Higgs physics, supersymmetry, and superstring theory. Students may present their own research results.

Prerequisite: Prerequisite(s): PHYS 218. Enrollment is restricted to graduate students.

PHYS 291D - Experimental High-Energy Collider Physics (2)

Seminar on current results in experimental high-energy particle physics. Topics follow recently published results, including design of experiments, development of particle detector technology, and experimental results from new particle searches, quantum chromodynamics, and properties of heavy flavor quarks.

Prerequisite: Enrollment is restricted to graduate students.

PHYS 291E - Applied Physics (2)

Intensive research seminar on applied physics and related topics in materials science, including semiconductor devices, optoelectronics, molecular electronics, magnetic materials, nanotechnology, biosensors, and medical physics. Students may present their own research results.

Prerequisite: Enrollment is restricted to graduate students.

PHYS 291F - Experimental High-Energy and Particle Astrophysics Seminar (2)

Survey of current research in experimental high-energy and particle astrophysics. Recent observations and development in instrumentation for x-rays, gamma rays, and neutrinos, and evidence for dark matter and other new particles. Students lead discussion of recent papers.

Prerequisite: Enrollment is restricted to graduate students.

PHYS 291G - Condensed Matter Physics Research Seminar (2)

Weekly seminar series covering topics of current interest in condensed matter physics. Local and external speakers discuss their work.

Prerequisite: Enrollment is restricted to graduate students.

PHYS 292 - Seminar (0)

Weekly seminar attended by faculty and graduate students. Directed at all physics graduate students who have not taken and passed the qualifying examination for the Ph.D. program.

Prerequisite: Enrollment is restricted to graduate students only, except by permission of instructor.

PHYS 292F - Seminar (2)

Seminar

PHYS 297A - Independent Study (5)

Enrollment restricted to graduate students only, except by permission of instructor.

PHYS 297B - Independent Study (10)

Enrollment restricted to graduate students only, except by permission of instructor.

PHYS 297C - Independent Study (15)

Enrollment restricted to graduate students only, except by permission of instructor.

PHYS 298 - Theoretical and Experimental Research Project (5)

Enrollment restricted to graduate students only, except by permission of instructor.

PHYS 299A - Thesis Research (5)

Enrollment restricted to graduate students only, except by permission of instructor.

PHYS 299B - Thesis Research (10)

Enrollment restricted to graduate students only, except by permission of instructor.

PHYS 299C - Thesis Research (15)

Enrollment restricted to graduate students only, except by permission of instructor.

POLI - POLITICS

Lower-Division

POLI 1 - Politics: Power, Principle, Process, and Policy (5)

Systematic introduction to the nature of politics and government, organized around the dynamic relationship between power, principle, and process in democratic politics. Provides historic and contemporary overview; explores the interactions among government, laws, and societies at the national and international levels.

POLI 3 - Keywords: Concepts in Politics (5)

Introduces key concepts in political discourse and key debates generated by contested terms such as powers, ideology, and multiculturalism. Students read from canonical texts, feminist scholarship, historical materials, and contemporary cultural and postmodernist writings.

POLI 4 - Citizenship and Action (5)

What does a citizen do? What kind of citizen activity is appropriate to democratic aspirations? Course uses political

theory to answer these questions as they relate to current and historical events, primarily in the North American context. Draws on texts ranging from Aristotle, Locke, Thoreau, Ellison, and Ranciere, as well as present-day debates, to bear on the relationship of citizen action and identity.

POLI 17 - U.S. and the World Economy (5)

Explores intellectual and empirical trends shaping the U.S. relationship with the global economy. Traces debates about liberalism and interventionism, surveys post-war American foreign economic policy and discusses varieties of capitalism emerging around the world.

POLI 20 - American Politics (5)

Introduces the study of politics through an analysis of the United States political system and processes. Topics vary, but may include political institutions, public policies, parties and electoral politics, and social forces.

POLI 21 - Governing the Golden State (5)

Introduces key principles for understanding state politics in California and how power is mobilized for transformative change. Analyzes distinctive features of California's political development and culture in the governance of enduring social problems and policy dilemmas.

POLI 45 - Music and Politics in Contemporary Society (5)

Introduces music to the study of politics. Considers the fields of music and identity; music and social movements; and theories of music, art, and revolution.

POLI 46 - Africa in Global Perspective (5)

Explores interdisciplinary methods, theories, and practices involved in producing and reproducing knowledges about Africa and the West within global politics. Examines ideas of international relations, international political economy, development, military structures, cultural formations, and the state through the critical use of film, literature, and scholarly texts.

POLI 60 - Comparative Politics (5)

Introduces the study of politics through the analysis of national political systems within or across regions from the developing world to post-industrial nations. Typical topics include: authoritarian and democratic regimes; state institutions and capacity; parties and electoral systems; public policies; social movements; ethnic conflict; and globalization.

POLI 61 - Politics of Social Policy (5)

Introduces social policy around the world. Some countries provide free and good-quality health and education, as well as a minimum income to all citizens. Others, instead, provide meager benefits to few citizens.

POLI 65 - Introduction to International Relations (5)

Surveys major theories of international relations including realism, liberal institutionalism, constructivism, and newer approaches focused on problems of asymmetric warfare.

Examines problems such as nuclear proliferation, international terrorism, global trade conflict, climate change, and humanitarian intervention.

POLI 70 - Global Politics (5)

Can common global interest prevail against particular sovereign desires? Surveys selected contemporary issues in global politics such as wars of intervention, ethnic conflict, globalization, global environmental protection, and some of the different ways in which they are understood and explained.

POLI 89 - Foundations for Global and Community Health (5)

Foundations for Global and Community Health is an interdisciplinary introduction to global and community health. It provides students with the foundational knowledge, vocabulary, and analytical tools to enter global health. It emphasizes the wide-ranging community meanings and contextual conditions shaping health from local to global scales. Co-taught by faculty from the natural sciences and social sciences, the course also introduces students to global and community health, highlighting opportunities for learning that involve collaboration and conversation between natural scientists and social scientists.

Upper-Division

POLI 100 - Politics Writing-Intensive Seminar (5)

Focuses on methods and approaches to writing effective and persuasive argumentative essays as a core component of the study of politics. Topics vary by instructor, and consider central concepts and issues in political life. The course material is explored as a means through which to develop basic and advanced skills in writing, as well as in argumentation, analysis, and critical engagement with readings through seminar-style discussions.

POLI 101 - Introduction to Research Methods (5)

Overview of research methods and data analytic techniques used in politics. Through hands-on learning, students critically evaluate social research reports, conduct investigations, describe data, assess statistical relationships, and test hypotheses. Prepares students to conduct the in-depth research required in upper-division courses.

Prerequisite: Enrollment is restricted to sophomore, junior, and senior politics majors during first and second pass enrollment.

POLI 189 - Pandemics, Politics, and Global and Community Health (5)

Examines the lessons for global and community health that are emerging from our experiences of COVID. These experiences have been characterized by vast variations in exposure and vulnerability as well as wide variations in response and resilience. All these variations teach us much about inequalities in global and community health, but they also highlight new opportunities for addressing injustice and restoring health as a shared human right. By treating the pandemic this way as portal for the re-imagining and remaking of global and community health, the course focuses on moving systematically from

evidence about disease, its inequalities, and policy responses to ideas about improving health outcomes both locally and globally.

POLI 102 - Doing Research (5)

Introduction to conceptualizing and executing qualitative research in the social sciences. Qualitative methods are non-statistical modes of social inquiry, including case studies, interviews, and archival research. Research methods cannot be done in a passive way. Really understanding methodology requires Doing Research.

Prerequisite: Enrollment is restricted to politics and Latin American and Latino studies/politics combined majors during first and second pass enrollment.

POLI 103 - Feminist Interventions (5)

Situates ongoing debates around feminist theory and practice within the context of political theory, the role of the state, and the position of women in contemporary (predominantly Western) society. Engages with classical political theory, second wave feminism, and the role of the state on matters pertaining to pornography and prostitution.

Prerequisite: Enrollment is restricted to politics, legal studies, and Latin American and Latino studies/politics combined majors during first and second pass enrollment.

POLI 105A - Ancient Political Thought (5)

Explores tensions between reason and revelation, justice and democracy, and freedom and empire through close readings of ancient texts. Emphasis on Athens, with Hebrew, Roman, and Christian departures and interventions. Includes Sophocles, Thucydides, Socrates, Plato, Aristotle, Stoics, the Bible, and Augustine.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

POLI 105B - Early Modern Political Thought (5)

Studies republican and liberal traditions of political thought and politics. Authors studied include Hobbes, Locke, and Rousseau. Examination of issues such as authorship, individuality, gender, state, and cultural difference.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

POLI 105C - Modern Political Thought (5)

Studies in 19th- and early 20th-century theory, centering on the themes of capitalism, labor, alienation, culture, freedom, and morality. Authors studied include J. S. Mill, Marx, Nietzsche, Foucault, Hegel, Fanon, and Weber.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

POLI 105D - Contemporary Political Theory: Modernity and its

Discontents (5)

Examines the condition of modernity as it is understood, dwelled upon, and critiqued by political theorists since the second half of the 20th century. Explores how the modern condition was viewed by Euro-American thinkers, who saw themselves as its originators and heirs, as well as Chinese, Indian, Arab, and African thinkers for whom European modernity was an inescapable, if not an insurmountable, imposition to be engaged, transformed, and critiqued. (Formerly Late-20th Century Political Thought.)

POLI 108 - Revolt, Rebellion, Revolution (5)

Examines revolt, rebellion, and revolution as ideas in political theory, and as prisms through which we can analyze historical events. Introduces works of political theory (historical and contemporary), and looks at historical events considered to be revolts and/or revolutions.

Prerequisite: Enrollment is restricted to politics and Latin American and Latino studies/politics combined majors during first and second pass enrollment.

POLI 110 - Law and Social Issues (5)

Examines current problems in law as it intersects with politics and society. Readings are drawn from legal and political philosophy, social science, and judicial opinions.

Prerequisite: Enrollment is restricted to politics, legal studies, and Latin American and Latino studies/politics combined majors during first and second pass enrollment only.

POLI 111A - Constitutional Law (5)

An introduction to constitutional law, emphasizing equal protection and fundamental rights as defined by common law decisions interpreting the 14th Amendment, and also exploring issues of federalism and separation of powers. Readings are primarily court decisions; special attention given to teaching how to interpret, understand, and write about common law.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to politics and Latin American and Latino studies/politics combined majors during priority enrollment only.

POLI 113 - Feminism and the Body (5)

Introduces the literature on the history of the body. Explores the multiple ways in which the body, in the West, has been the site of cultural and political inscription from the Middle Ages to the 19th century. Topics may include: pornography, criminality, sexuality, art, race, and medicine.

Prerequisite: Enrollment is restricted to politics and Latin American and Latino studies/politics combined majors during first and second pass enrollment.

POLI 114 - Thinking Green: Politics, Philosophies, and Practices of Sustainability (5)

A course on the political and philosophical sources of ecological and social sustainability and how they affect and inflect the design, implementation, and practices of

sustainability. Asks whether they offer a realistic alternative to liberalism and other political and economic ideologies and practices.

Prerequisite: Enrollment is restricted to politics and Latin American and Latino studies/politics combined majors during first and second pass enrollment.

POLI 115 - Foundations of Political Economy (5)

Examines how ideas about labor, rights, exchange, capital, consumption, the state, production, poverty, luxury, morality, procreation, and markets were woven in political-economic discourse from 1690-1936. Readings include Locke, Mandeville, Smith, Malthus, Mill, Hegel, Marx, Lenin, and Veblen. Particular focus given to theoretical origins of and justifications for poverty and implications of economic interdependence for politics.

Prerequisite: Prerequisite(s): POLI 105B, POLI 105C, or POLI 120C. Enrollment is restricted to politics and Latin American and Latino studies/politics combined majors during first and second pass enrollment.

POLI 117 - Manufactured Truth and Narratives of Power (5)

Introduction to techniques used to produce power, notably by manufacturing and distorting truth from overt propaganda to public relations or advertising. Each week will focus on one conceptual apparatus used to frame reality, its related techniques and strategies as well as its economic, social or political objectives. Frameworks will include bureaucratic rationality, totalitarian propaganda, colonial mythology, state euphemism, "democratic" story-telling, conspiracy theories, branding, and green-washing. Enrollment by permission of instructor.

POLI 118 - Critical Political Thought and Critical Theory (5)

Course uses a multidisciplinary approach to the study of politics through significant contemporary authors and approaches in critical theory. Topics include: democracy action, violence, subjectivity, identity, power and resistance, the body, political economy, and post-colonialism. (Formerly Topics in Contemporary Political and Critical Theory.)

Prerequisite: Enrollment is restricted to politics and Latin American and Latino studies/politics combined majors during first and second pass enrollment.

POLI 120A - Congress, President, and the Court in American Politics (5)

Study of political development, behavior, performance, and significance of central governmental institutions of the U.S. Emphasizes the historical development of each branch and their relationship to each other, including changes in relative power and constitutional responsibilities.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

POLI 120B - Society and Democracy in American Political

Development (5)

Examines the role of social forces in the development of the American democratic processes and in the changing relationship between citizen and state. Course materials address the ideas, the social tensions, and the economic pressures bearing on social movements, interest groups, and political parties.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

POLI 120C - State and Capitalism in American Political Development (5)

Examines the relationship between state and economy in the U.S. from the 1880s to the present, and provides a theoretical and historical introduction to the study of politics and markets. Focus is on moments of crisis and choice in U.S. political economy, with an emphasis on the rise of regulation, the development of the welfare state, and changes in employment policies.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

POLI 121 - Race & Justice in America (5)

Examines how "race" is forged as a distinctive concept and logic of governance in American Politics; Undercurrents of racial reasoning in transcendent notions of "justice" in the U.S. are traced from the nation's founding into the 21st century.

Prerequisite: Enrollment is restricted to politics majors during first and second pass enrollment.

POLI 122 - Politics, Labor, and Markets (5)

Examines political and social dimensions of recent transformations in the U.S. labor market. Includes classical and contemporary theoretical debates over the nature and functions of work under capitalism. Focuses on shifts in the organization and character of work in a globalizing economy. Addresses recent trends in low-wage and contingent work, job mobility and security, and work/family relations. Includes attention to the roles and responses of business, labor, and government.

Prerequisite: Enrollment is restricted to politics and Latin American and Latino studies/politics combined major during first and second pass enrollment.

POLI 124 - Economic Inequality in America (5)

Examines the sources and implications of economic inequality in the United States. Explores theories of social class and its intersections with race and gender inequalities. Focuses on the role of politics and public policies in diminishing and/or exacerbating income and wealth inequalities.

Prerequisite: Enrollment is restricted to politics and Latin American and Latino studies/politics combined majors during first and second pass enrollment.

POLI 125 - Political Organizations in American Politics (5)

Introduces the literature on interest groups and attempts to answer the question: Do such groups promote or hinder American democracy? Class readings and lectures review and assess the participation of interest groups in the electoral process and in Congress, the executive branch, and the courts.

POLI 127 - Parties and Partisanship in American Politics (5)

Explores several important topics in the study of parties and partisanship in American politics; for example, the development of the party system, parties as organizations, parties in government, parties in the electorate, polarization, partisan identification, and state-level variation.

Prerequisite: Enrollment is restricted to politics and Latin American and Latino studies/politics combined majors during first and second pass enrollment.

POLI 128 - American Elections and Voting Behavior (5)

Introduces key concepts pertaining to voting, elections, and political behavior in the United States. Several topics are covered, such as campaigns, electoral institutions, reform, political participation (including but not limited to voting), presidential and congressional elections, partisan identification, and polling.

Prerequisite: Enrollment is restricted to politics majors and Latin America and Latino studies/politics combined majors during first and second pass enrollment.

POLI 129 - Policies and Politics of American Defense (5)

Examines the evolution of the policy and politics of American national security, from the Cold War to the present. Content of military policy explored with analytic focus on formation of policy and interactions between military policies and domestic policies.

Prerequisite: Enrollment is restricted to politics and Latin American and Latino studies/politics combined majors during first and second pass enrollment.

POLI 132 - California Water Law and Policy (5)

Explores the rich history and fundamental legal concepts surrounding water in California. Students identify, evaluate, and debate some critical water policy questions faced by Californians today and in the future.

POLI 134 - Congress: Representation and Legislation (5)

Examines the United States Congress and the nature of the representative and legislative processes. Topics include: districting and elections; bicameralism; party organization; institutional and behavioral influences on legislative action; and the efficacy of Congress as a legislative body. Focuses on the contemporary Congress with comparisons to other legislative and representative institutions.

Prerequisite: Enrollment is restricted to politics and Latin American and Latino studies/politics combined majors during first and second pass enrollment.

POLI 135 - Immigration Policy and Debate in the U.S. (5)

Course charts the history of immigration policy and debate in the U.S., highlighting the ways economic, social, and geopolitical factors influenced the processes and outcomes of immigration debate and policy making. Focuses on interaction between society and state in formulation and implementation of immigration policy, and the ways policy outcomes may differ from expectations.

Prerequisite: Enrollment is restricted to politics and Latin American and Latino studies/politics combined majors during first and second pass enrollment.

POLI 136 - Applied Public Policy (5)

Focuses on the application of theory to practice by creating an opportunity for students to explore and analyze the connections between federal, state, and local policies and their impacts on day-to-day programs in the Santa Cruz community and region.

Prerequisite: Enrollment is restricted to junior and senior politics and Latin American and Latino studies/politics combined majors during first and second pass enrollment.

POLI 136F - Applied Public Policy Internship (2)

This internship in governmental, public policy, and advocacy organizations and leaders in the Santa Cruz area requires a minimum of 50 hours with an assigned field study organization, a field journal, and limited classroom work.

Prerequisite: Prerequisite(s): POLI 136. Enrollment is restricted to politics and Latin America and Latino studies majors.

POLI 140A - European Politics (5)

Explores the political and economic systems of advanced industrialized societies. In addition to specific comparisons between the countries of western Europe and the United States, covers important themes and challenges, including immigration, globalization, and the crisis of the welfare state.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

POLI 140C - Latin American Politics (5)

Overview of major approaches to the study of Latin American politics. Introductory survey of historical and contemporary democratic populist, authoritarian, and revolutionary regimes. Special attention is given to region's recent transitions toward democratic rule, market-based economic models, and decentralized governance. Evaluates institutional arrangements (including presidentialism, electoral rules and party systems), as well as a variety of social movements and strategies of resistance among subaltern social groups and classes.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

POLI 140D - Politics of East Asia (5)

Explores the political development of East Asia's primary democracies: Japan, South Korea, and Taiwan. Examines the historical origins of these states, the process through which they

emerged from authoritarian roots, and topics such as protest, corruption, and women's political roles.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

POLI 141 - Politics of China (5)

Introduces themes of Chinese politics from 1949 to present, including: the establishment and substantial dismantling of socialism; movements and upheavals, such as the Cultural Revolution and 1989; and issues, such as Hong Kong and Tibet. Surveys current institutions, leaders, and policies.

Prerequisite: Enrollment is restricted to politics and Latin American and Latino studies/politics combined majors during first and second pass enrollment.

POLI 142 - Russian Politics (5)

Historical-political survey of Russia within the U.S.S.R. is followed by examination of the 1991 revolution, the attempt to recover a national identity and establish a unified Russian state. Highlighted in this course are cultural and political factors central to the Russian experience: personalistic modes of political organization, a remote and corrupt state apparatus, collectivist forms of thought and self-defense.

POLI 143 - Comparative Post-Communist Politics (5)

Comparative study of revolutionary transformations of East European, Soviet, and former Soviet nations to post-Communist political orders. Focus on reemergence of political society, social and economic problems of transition, and maintenance of many cultural norms and authority patterns associated with previous regime.

Prerequisite: Enrollment is restricted to politics and Latin American and Latino studies/politics combined majors during first and second pass enrollment.

POLI 144 - Andean Politics (5)

Examines similar political trends in four Andean countries: Bolivia, Colombia, Ecuador, and Peru. Trends include mobilization of indigenous populations, breakdown of traditional party systems, and reconstruction efforts in post-conflict environments. Students who have taken prior courses in Latin American politics, including POLI 140C, will be best prepared for this course.

Prerequisite: Enrollment is restricted to politics and Latin American and Latino studies/politics combined majors during first and second pass enrollment.

POLI 146 - The Politics of Africa (5)

Comparative study of contemporary sub-Saharan African states. Selected issues and countries. Internal and external political institutions and processes are studied in order to learn about politics in contemporary Black Africa and to learn more about the nature of politics through the focus on the particular issues and questions raised by the African context.

Prerequisite: Enrollment is restricted to politics majors during first and second pass enrollment.

POLI 147 - The Politics of Territorial Conflict (5)

Examines the phenomenon of territorial conflict within countries. Focuses on territorial cleavages that occur when minority groups are geographically concentrated within particular territories, and emphasizes attempts to accommodate these cleavages through measures like autonomy, federalism, and decentralization.

POLI 148 - Social Movements (5)

Overview of social movements by analysis of specific theories and examples. Course connects the study of theories and movements to larger political processes. Topics may include: New Social Movement theory; gender and social movement; democratic, historical, transnational, global and/or local social movements.

Prerequisite: Enrollment is restricted to politics and Latin American and Latino studies/politics combined majors during first and second pass enrollment.

POLI 149 - Democratic Transitions (5)

Explores democratization processes from a variety of historical and geographical perspectives. Examines the role of foreign influences, economic development, civil society, elites, and institutions in the transition and consolidation of democratic systems.

Prerequisite: Enrollment is restricted to politics and Latin American and Latino studies/politics majors during first and second pass enrollment.

POLI 151 - Politics of Law (5)

Uncovers the important debates in politics and law around the functions of courts, litigation, and rights--and the political nature of law itself. Course is interdisciplinary, and draws from literature in political science, law, and sociology.

Prerequisite: Enrollment is restricted to politics, legal studies, and Latin American and Latino studies/politics combined majors during first and second pass enrollment.

POLI 152 - Middle East Politics (5)

Investigates the evolution of the Arab nationalist state, from decolonization to the uprisings of 2010-2011. Examines the changes and continuities in Middle Eastern politics over the past 60 years by focusing on questions of violence, political economy, and culture.

Prerequisite: Prerequisite(s): POLI 60 or POLI 65 or POLI 70. Enrollment is restricted to politics and Latin American and Latino studies/politics combined majors during first and second pass enrollment.

POLI 153 - Urban Politics (5)

Provides an introduction to issues and challenges facing cities in the U.S. and abroad, as well as the policy remedies available to government and the private sector. The first part of the course provides the foundations to the study of urban politics by examining core questions in local government institutions and urban coalitions. The second part of the course examines urban

policies in a variety of areas, such as growth, redevelopment, housing, and poverty.

POLI 154 - The Philippines and the World (5)

Introduces students to the histories, societies, and politics of the Philippines. Surveys major historical eras, and treats topics such as the state, revolts and revolution, labor, religion, the environment, martial law.

POLI 160A - Theories of International and World Politics (5)

Examination of analytical perspectives on international and world politics, international and global political economy, war and conflict, corporations and civil society. Explores theoretical tools and applications, recurring patterns of global conflict and cooperation, the nexus between domestic politics, foreign policy and international and world politics. This is not a current events course.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

POLI 160B - International Law (5)

Origins and development of international law: international law is examined both as a reflection of the present world order and as a basis for transformation. Topics include state and non-state actors and sovereignty, treaties, the use of force, and human rights.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

POLI 160C - Security, Conflict, Violence, War (5)

Genesis and theories of conflict and war and their avoidance (past, present, future). Relationship between foreign policy and intra- and interstate conflict and violence. National security and the security dilemma. Non-violent conflict as a normal part of politics; violent conflict as anti-political; transformation of conflict into social and interstate violence. Interrelationships among conduct of war, attainment of political objectives, and the end of hostilities. Civil and ethnic wars. Political economy of violence and war.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

POLI 160D - International Political Economy (5)

Introduction to the politics of international economic relations. Examines the history of the international political economy, the theories that seek to explain it, and contemporary issues such as trade policy, globalization, and the financial crisis.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

POLI 161 - The Rise of China (5)

Explores China's rising international power and the implications thereof. Special emphasis on China's interactions with the United States and related issues (Korea, Taiwan, the South China Sea). Also addresses China's dealings with South Asia,

Southeast Asia, Africa, Japan, international organizations, and more. (Formerly Foreign Relations of China.)

Prerequisite: Enrollment is restricted to politics and politics/Latin America and Latino studies combined majors during first and second pass enrollment.

POLI 163 - U.S. Foreign Policy (5)

Provides overview of U.S. foreign policy formulation: considers how U.S. political culture shapes foreign policy; examines governmental actors involved: the president, executive branch agencies, and Congress; then considers non-governmental actors: the media, interest groups, and public opinion.

Prerequisite: Enrollment is restricted to politics and politics/Latin American and Latino studies combined majors during first and second pass enrollment.

POLI 165 - Global Organization (5)

Addresses whether and how global organizations are changing the international system. Examines multilateral institutions, regional organizations, and nonstate actors. Overriding aim is to discern whether these global organizations are affecting the purported primacy of the state.

Prerequisite: Enrollment is restricted to politics and Latin American and Latino studies/politics combined majors during first and second pass enrollment.

POLI 166 - Politics of Migration (5)

Examines the magnitude and the political, economic, cultural, environmental, and social impact of today's movement of millions of people within and amongst states.

Prerequisite: Enrollment is restricted to politics majors and Latin American and Latino studies/politics combined majors during first and second pass enrollment.

POLI 167 - Politics of International Trade (5)

Examines key issues in international trade, including the distribution of gains, fair trading practices, and preferential trade agreements. Focuses on the political dimensions of trade, the rules of the international trade system, and conflicts within countries that international trade generates.

Prerequisite: Enrollment is restricted to politics, and Latin American and Latino studies/politics combined majors during first and second pass enrollment.

POLI 168 - Topics in International Relations and Global Politics (5)

Examines contemporary issues in international relations, global politics, and global political economy through theoretical and applied frameworks, program assessment, sectoral and structure analysis, and across levels of analysis.

Prerequisite: Prior enrollment in POLI 160A is recommended, but not required. Enrollment is restricted to politics and Latin American and Latino studies/politics combined majors during first and second pass enrollment.

POLI 169 - Politics of Development (5)

Introduces the politics of development. Examines the theories, history, and economics of development. Analyzes several contemporary issues. Readings include contemporary writings in the field and classical works on theoretical approaches.

Prerequisite: Enrollment is restricted to politics and Latin American and Latino studies/politics combined majors during first and second pass enrollment.

POLI 172 - Liberalism, the State, and the War on Terror (5)

Examines the relation between the liberal State and perceived challenges to State sovereignty posed by transnational terrorism. How does terrorism as both a symbol and empirical phenomenon fit within the horizon of liberal ideology? What claim to sovereignty does the State make in the face of acts of terror? What political logic is required in/for a War on Terror? Students may not take both course 72 and this course for credit in the major.

Prerequisite: Enrollment is restricted to politics and politics/Latin America and Latino studies majors during first and second pass enrollment.

POLI 174 - Global Political Ecology (5)

Explores the global dimensions of complex environmental issues such as climate change, biodiversity, deforestation, and fisheries: how they are produced, how they manifest, and how they are governed in response.

Prerequisite: Enrollment is restricted to politics and Latin American and Latino studies/politics combined majors during first and second pass enrollment.

POLI 175 - Human Rights (5)

Embraces an interdisciplinary approach to the study of human rights. Captures the malleable nature of human rights and the contours of its dual role as both law and discourse.

Prerequisite: Enrollment is restricted to politics and legal studies majors during first and second pass enrollment. Prior coursework in International Law (POLI 160B / LGST 160B) is recommended.

POLI 182 - The Power to Punish (5)

Interrogates the presuppositions of punishment as legitimate state power. Decentering crime as punishment's conceptual predicate, wider analysis of the penal state's social-scientific, jurisprudential, and philosophical foundations force us to ask: What is punishment? Why punish? How, and whom, to punish?

Prerequisite: Enrollment is restricted to politics majors during first and second pass enrollment.

POLI 184 - Shariah and Political Thinking: Law and Politics in Modern Islamic Thought (5)

What defines just political rule in Islam? How do modern Muslim thinkers conceive the role of Islamic normative guidelines (Shariah) in the context of secular modern nation-

states? Course surveys how major trends in modern Islamic thought try to answer this question.

Prerequisite: Enrollment is restricted to politics majors during the first and second pass enrollment.

POLI 185 - Political Psychology (5)

Provides a broad introduction to the growing interdisciplinary field of political psychology. Focuses on and critically analyzes classic and contemporary psychological perspectives, primarily through original sources. Draws upon theoretical ideas and experimental results to understand political actors, events, and processes.

Prerequisite: Enrollment is restricted to politics and combined politics and Latin America and Latino studies majors during first and second pass enrollment.

POLI 186 - Global Health Politics (5)

Examines the politics surrounding both global health problems and policy responses. Traces the evolving interrelationships between these problems and policies from colonial health to the impacts of austerity on postcolonial health systems to today's globally targeted responses.

Prerequisite: Enrollment is restricted to politics and Latin American and Latino studies/politics majors during first and second pass enrollment.

POLI 190B - Humanity, Sovereignty, and War (5)

Examines how enmity, the state, and war serve as limits for political conceptions of who we are, tensions between commitments to diversity and to peace, and liberal and humanitarian efforts to address these tensions. Students examine works written prior to the liberal period (Hobbes), in response to it (Hegel and Schmitt) and finally a 20th-century liberal revival (Rawls), and discuss rights, conscience, political obligation, war, and the state.

Prerequisite: Prerequisite(s): two of the following: POLI 103, POLI 105A, POLI 105B, POLI 105C, POLI 105D, POLI 107, POLI 109, or POLI 115. Enrollment restricted to senior politics and Latin American and Latino studies/politics combined majors.

POLI 190C - Postcolonial Visions of Liberation (5)

How do postcolonial thinkers conceive of freedom and equality in the wake of a colonialism that irreversibly reshaped their modes of life? Course closely reads central works of postcolonial theory to examine how they address this question. (Formerly Humanitarian Action in World Politics.)

Prerequisite: Enrollment is restricted to senior politics and politics/Latin American and Latino studies combined majors.

POLI 190D - Early Anarchist and Socialist Thought (5)

Studies in 19th- and early 20th-century anarchist and socialist thought. Themes covered include property, labor, marriage, and the state. Readings drawn from Bakunin, Goldman, Fourier, Kropotkin, Perkins-Gilman, Proudhon, and Stirner.

Prerequisite: Prerequisite(s): two of the following: POLI 103, POLI 105A, POLI 105B, POLI 105C, POLI 105D, POLI 109, or POLI 115; or by permission of instructor. Enrollment is restricted to senior politics majors.

POLI 190E - Transitions (5)

Explores the role of new media in political protest; whether and how new media technologies such as social networking, text messaging, Twitter, and YouTube have changed the way opposition movements develop.

Prerequisite: Enrollment is restricted to senior politics and Latin America and Latino studies/politics combined majors.

POLI 190F - Topics in Urban Governance (5)

Cities are at the frontlines of complex global issues including climate change, international terrorism, and transnational migration. Course situates cities in the dynamics of world politics, and explores the possibilities and prospects of global urban/global governance in the 21st Century.

Prerequisite: Enrollment is restricted to senior politics and Latin American and Latino studies/politics combined majors.

POLI 190G - Issues in International Law (5)

Explores theory and reality of international law; how it determines or governs or modifies policies of government. Emphasis on contemporary political and economic forces and international law in nuclear age, competing areas for new law, law of seas, human rights, new international economic issues, the environment.

Prerequisite: Enrollment is restricted to senior legal studies, politics, and Latin American and Latino studies/politics combined majors.

POLI 190H - The Substance of Democracy (5)

What is democracy? How can we identify it? How do we understand and identify political participation? What are the factors behind it? What role does protest have in democratic politics? These and similar questions are addressed in this course that focuses on topics of democratic politics in the United States and abroad.

Prerequisite: Enrollment is restricted to senior politics and combined politics/Latin American and Latino studies majors.

POLI 190J - Politics and Inequality (5)

Considers causes and consequences of inequality in modern societies. Emphasizes empirical analysis of contemporary forms of class, racial, and gender inequality and examination of normative theories of distributive justice. Major restrictions lifted during open enrollment.

Prerequisite: Enrollment is restricted to senior politics and Latin American and Latino studies/politics combined majors.

POLI 190L - Poverty Politics (5)

Examines theoretical, historical, and contemporary sources of poverty policies in the United States. Explores competing

theories of the causes of poverty and the consequences of social provision. Focuses on successive historical reform efforts and contemporary dilemmas of race and urban poverty, gender and family poverty, work, and the politics of welfare reform.

Prerequisite: Enrollment is restricted to senior politics and Latin American and Latino studies/politics combined majors.

POLI 190M - Politics in American States (5)

State governments affect the lives of Americans every day. This course examines an array of issues pertaining to state politics, such as the foundations of American federalism, institutional organization, elections, political parties, direct democracy, and policy-making.

Prerequisite: Enrollment is restricted to senior politics and combined politics/Latin America and Latino studies majors.

POLI 190N - Problems and Solutions in U.S. Politics (5)

Examines problems and potential solutions to issues in U.S. politics, such as presidential power, partisan polarization, money in elections, foreign and security policy, civil rights and liberties, and taxation and spending.

Prerequisite: Enrollment is restricted to senior politics and Latin American and Latino studies/politics combined majors.

POLI 190O - Constitutional Meanings and Movements (5)

Explores how civic groups and social movements have confronted and shaped constitutional rights, equality, and power. Examines a range of U.S. movements from the 18th Century to the 21st Century-era of Marriage Equality, Tea Party, and Dreamer movements. (Formerly Constitutional Meanings and Movements: Exploring the Ideas, Laws, and Politics in Social Change.)

POLI 190P - Race: History of a Concept (5)

Examines how we came, by the late 19th century, to classify humanity into racial categories. In an effort to trace emergence of this very modern phenomenon, explores historical shifts that informed Europe's representation of cultural difference from the writings of ancient Greeks to the social Darwinism of 19th-century Britain.

Prerequisite: Enrollment is restricted to senior politics and Latin American and Latino studies/politics combined majors.

POLI 190Q - Theorizing Modernity (5)

Introduces central categories and material implications that underwrite discourses on modernity since the late 18th century. Students read across the disciplines in fields such as political theory, postcolonialism, history, science studies, anthropology, and feminist criticism.

Prerequisite: Prerequisite(s): any two of the following courses: POLI 105A, POLI 105B, POLI 105C, POLI 105D. Enrollment is restricted to senior politics and Latin American and Latino studies/politics combined majors during first and second pass enrollment.

POLI 190R - Comparative Law and Society (5)

Interdisciplinary investigation into functions of law across political, historical, and cultural contexts. Examines the international and comparative turn in public law scholarship and the role of law-based strategies in state building. Reviews literature in law, political science and legal anthropology.

Prerequisite: Prerequisite(s): POLI 160B. Enrollment is restricted to senior politics and Latin American and Latino studies/politics combined majors.

POLI 190T - Governance and Conflict in East Asia (5)

Students read recent books on East Asian countries that engage the long-standing themes of state power and societal resistance.

Prerequisite: Prerequisite(s): POLI 141 or POLI 161 or POLI 109, or by permission of instructor. Enrollment is restricted to senior politics majors.

POLI 190V - States in the Global South (5)

Focuses on the causes and consequences of state capacity in the global south, asking why states are much stronger in some countries than others and how their relative strength affects important substantive outcomes, including democracy, development, and security. (Formerly Problems in Latin American Politics.)

Prerequisite: Enrollment is restricted to juniors and seniors politics majors.

POLI 190W - Topics in Latin American Politics (5)

Examines how Latin American governments function and what major challenges countries in the region are facing. Focuses on democracy, economic development, gender and indigenous politics, social policies, poverty, and inequality.

Prerequisite: Enrollment is restricted to senior politics majors.

POLI 190Z - International Security (5)

Examination of selected issues, controversies, and theories relevant to security between and among nations. Topics vary, but may include: war, peace, nuclear proliferation, arms control, military and foreign policies, alternative conceptions of security.

Prerequisite: Enrollment is restricted to senior politics and Latin American and Latino studies/politics combined majors .

POLI 193 - Field Study in Politics (5)

Individual studies undertaken off campus with direct faculty supervision. Students submit petition to sponsoring agency.

POLI 194 - Group Tutorial (5)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Various topics to be announced before each quarter. Students submit petition to sponsoring agency.

POLI 194F - Group Tutorial (2)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Various topics to be announced before each quarter. Students submit petition to sponsoring agency.

POLI 195A - Senior Thesis (5)

Preparation of a senior thesis over two or three quarters, beginning in any quarter. The grade and evaluation submitted for the final quarter apply to each of the previous quarters. Students submit petition to sponsoring agency.

POLI 195B - Senior Thesis (5)

Preparation of a senior thesis over two or three quarters, beginning in any quarter. The grade and evaluation submitted for the final quarter apply to each of the previous quarters. Students submit petition to sponsoring agency.

POLI 195C - Senior Thesis (5)

Preparation of a senior thesis over two or three quarters, beginning in any quarter. The grade and evaluation submitted for the final quarter apply to each of the previous quarters. Students submit petition to sponsoring agency.

POLI 198 - Independent Field Study (5)

Individual studies undertaken off-campus for which faculty supervision is not in person (e.g. supervision is by correspondence). Students submit petition to sponsoring agency.

POLI 198F - Independent Field Study (2)

Individual studies undertaken off-campus for which faculty supervision is not in person, but by correspondence. Students submit petition to sponsoring agency.

POLI 199 - Tutorial (5)

A student normally approaches a member of the staff and proposes to take a POLI 199 on a subject he or she has chosen which is not offered in other politics courses. Students submit petition to sponsoring agency.

POLI 199F - Tutorial (2)

A student normally approaches a member of the faculty and proposes to take a POLI 199 on a subject he or she has chosen which is not offered in other politics courses. Students submit petition to sponsoring agency.

Graduate**POLI 200A - Political and Social Thought Core Seminar (5)**

Draws on history of political thought, contemporary social and critical theory, and the contributions of legal and institutional analysis of various kinds to engage in critical study of political practices that are experienced or understood as in some way limiting, oppressive, or wrong; to transform our understanding of these practices; to see their contingent conditions; and to articulate possibilities of governing ourselves differently.

Prerequisite: Enrollment is restricted to graduate students.

POLI 200B - Social Forces and Political Change Core Seminar (5)

Concerns transformation of social forces into political ones. Focuses on formation, articulation, mobilization, and organization of political interests and identities, their mutual interaction, and their effects on state structures and practices and vice versa. Major themes are 1) social bases of political action: class, gender, race, and other determinants of social division and political identity and 2) relevant forms of political agency and action, including development of political consciousness and representation of interests and identities in the public sphere.

Prerequisite: Enrollment is restricted to graduate students.

POLI 200C - States and Political Institutions Core Seminar (5)

Introduces study of political institutions as instruments of collective decision making and action. Explores alternative theoretical approaches to development of political institutions, state and political economy, and security dilemmas.

Prerequisite: Enrollment is restricted to graduate students.

POLI 200D - Political Economy Core Seminar (5)

Introduction to the theories and methodologies of political economy. Focuses on the relationship between states and markets and considers the politics of economic choices and institutions germane to both national and global political institutions. Addresses origins and development of markets and capitalism; historical evolution of states and their economies; relationship between labor, capital, production, and consumption; regulation of production; macroeconomics and management of economies; and issues of national and global social welfare.

Prerequisite: Enrollment is restricted to graduate students.

POLI 201 - Logics of Inquiry (5)

Investigates approaches to study of politics and to enterprise of social science in general. Works from positivist, interpretive, historical, and critical approaches provide examples held up to critical and epistemological reflection.

Prerequisite: Enrollment is restricted to graduate students.

POLI 202 - Fundamentals of Political Research (5)

Gives students practical tools to transform research questions into viable and well-crafted research designs. Introduces conceptual development, various forms of data, and rules for case selection. The goal is to train students in a range of specific methods, including interviewing, ethnography, and archival work.

Prerequisite: Enrollment is restricted to graduate students.

POLI 203 - Making of the Modern (5)

Introduces, at the graduate level, some of the central conceptual categories and material implications that underwrite the world

of the modern. Explores concepts including the individual, historicism, contract, and objectivity.

Prerequisite: Enrollment is restricted to graduate students.

POLI 204 - Bodies in History (5)

The human body has been productive of a wide range of varied and competing discourses. Among the themes covered are sexuality, hygiene, the grotesque, and criminality.

Prerequisite: Enrollment is restricted to graduate students.

POLI 205 - Critical Perspectives on Classical Political Economy (5)

Explores seminal works in classical political economy, particularly its consolidation at the moment that industrial society emerged from commercial society, as demonstrated in the writings of Bernard Mandeville, Adam Smith, and Thomas Malthus.

Prerequisite: Enrollment is restricted to graduate students.

POLI 206 - Power and Pleasure (5)

Graduate seminar exploring connections between the body politic and human bodies, particularly as they relate to the sensory dimension of political and personal experience. The myriad ways these connections have been drawn, from antiquity to the present, belie the aspiration of philosophy to organize political life around reason. These connections also offer us ways in to consider the materiality of social life, and commercial life in particular, generating perspectives on capitalism and late modernity. Engagements with these materials also provide opportunities to explore the relationship between sensual materialism and affect theory.

Prerequisite: Enrollment is restricted to graduate students.

POLI 207 - Political Economies of Affect (5)

Explores the potential in philosophical precursors to recent affect theory, alongside classical political economy and its critics, to develop an alternative epistemology for political economy. Readings include: Aristotle, Spinoza, Deleuze, Hume, Negri, Hardt, Smith, Bergson, and Marx.

Prerequisite: Enrollment is restricted to graduate students.

POLI 208 - Race (5)

Considers the subject of race and racism from a political and historical perspective appealing to literatures from history, anthropology, science, and literary studies.

Prerequisite: Enrollment is restricted to graduate students.

POLI 209 - Radical Political Thought (5)

Focuses on early 19th- through early 20th-century socialist and anarchist thought, excluding Marx. Theorists studied include Saint-Simon, Fourier, Proudhon, Stirner, Bakunin, Kropotkin, Perkins Gilman, and Goldman. Some secondary literature and related contemporary theory is also treated.

Prerequisite: Enrollment is restricted to graduate students.

POLI 210 - Problems of Democracy in Comparative Perspective (5)

Democracy is an essential political concept, and a fundamentally contested one. Since the 1980s, scholars of comparative politics have attempted to explain why and when countries transition from authoritarianism to democratic institutions. However, regime change at the national level only sets the stage, leaving deeper questions about what democracy means in practice--how it plays out (or is undermined) throughout the state and at subnational levels; whom it includes and excludes; what options it opens; and what possibilities it forecloses. Such questions relate debates about the potential and the limitations of democracy in general.

Prerequisite: Enrollment is restricted to graduate students.

POLI 211 - Making and Unmaking Sovereignty (5)

Focuses on questions of sovereignty. Of what does sovereignty consist? How is it secured, proclaimed, and perpetuated? How is it insecure, contingent, and subject to contestation? How is the idea of individual sovereignty related to the idea of the sovereignty of the state? Our aim is less to answer these questions definitively than to explore them and understand how theorists (historical and contemporary) have explored them, and how different historical episodes illuminate them.

Prerequisite: Enrollment is restricted to graduate students.

POLI 213 - Who Governs the Globe? Exploring Agency and Authority in Contemporary World Politics (5)

Addresses the role of non- and sub-state actors in global governance. Explores the concept of agency in world politics, and the conditions under which these actors acquire global agency in contemporary world politics. Introduces various theoretical perspectives with which to identify and evaluate agency, with a focus on alternative sources of authority, identity, and power.

Prerequisite: Enrollment is restricted to graduate students.

POLI 214 - Thinking Green: Politics, Ethics, Political Economy (5)

Green political thought, philosophy, debates, and practices; history of ecological thought and comparative study of competing ideas and proposals. Critical examination of neo-liberal environmentalism.

Prerequisite: Enrollment is restricted to graduate students.

POLI 218 - Law and/Vs. Justice: The Rule of Law and Problems of (In)Justice (5)

Explores major debates on the role and rule of law in society, with attention to efforts to use law to seek justice or respond to injustice. This includes engaging in three overlapping sets of conversations: What is law—its sources and functions—and how, where, and on whom does it operate? What is the "rule of law"—what is it for and whom does/can it serve and how? What are different ways that people and groups grapple with or respond to the role of law in injustice—including "the Nazi problem," "the slavery problem," the colonialism/imperialism

problem, the Jim Crow/apartheid problem, etc—and what are the possibilities, challenges, and limits? Theoretical perspectives on the sources/origins and role of law in society will be considered as well as case studies and concrete examples that show how this tool is applied to particular challenges.

Prerequisite: Enrollment is restricted to graduate students.

POLI 222 - Conflict and Change in American Politics and Policy (5)

Explores the dynamic and contested interaction between politics and policy in the U.S. context, through examining the historical development of key contemporary policy debates and political conflicts. Introduces recent scholarship, drawing on history, sociology, and political economy that has challenged traditional behavioralist approaches to understanding American politics and policy development.

Prerequisite: Enrollment is restricted to graduate students.

POLI 223 - Topics in American Political Development (5)

Explores several important topics that have emerged from the renewed interest in political development, and are visible within its scholarship in American Political Development; for example, state-building, institutional change, representation, culture, participation, political identity, and economic and social transformations.

Prerequisite: Enrollment is restricted to graduate students.

POLI 232 - United States Political History (5)

Covers several important themes and sets of readings from the literature on American political development. Topics include the origins and development of American political institutions, the evolution of democratic mechanisms, the rise and fall of social movements, and debates about the sources of policy regimes and political change, including the role of war.

Prerequisite: Enrollment is restricted to graduate students.

POLI 243 - Comparative Methods (5)

Introduces the comparative method in social science. Trains students in the use of this method by examining how scholars have used it to compare across national governments, subnational units, public policies, organizations, social movements, and transnational collective action.

Prerequisite: Enrollment is restricted to graduate students.

POLI 245 - Latin American Politics (5)

Surveys the Latin American political literature by studying: 1) critical moments in political development (e.g., state formation, democratization); 2) important political institutions (e.g., presidentialism, party, and electoral systems); and 3) influential political actors (e.g., unions, business associations, social movements).

Prerequisite: Enrollment is restricted to graduate students.

POLI 247 - Comparative Urban Politics (5)

Focuses on local government structures and the relationships with other levels of government. Examines institutions and administration; urban political economy (fiscal strain, poverty, inequality, and the efforts to attract economic investment); political machines; race and ethnicity.

Prerequisite: Enrollment is restricted to graduate students.

POLI 249 - Politics of Protest (5)

Explores topics related to protest and political participation from theoretical and empirical perspectives.

Prerequisite: Enrollment is restricted to graduate students.

POLI 255 - Comparative Anti-Colonialisms (5)

Political thought of anti-colonial movements in comparative, historical perspective, including 18th- to 20th-Century European colonies of America and Asia. Focuses both on the contemporary political thought of these movements as well as on historiographical approaches of secondary literature.

Prerequisite: Enrollment is restricted to graduate students.

POLI 257 - Women Interpret Islam (5)

Examines how prominent female Muslim thinkers have interpreted the Islamic tradition since the early 20th century. It surveys how thinkers who belonged to different intellectual traditions (liberal, Marxist, Islamist, feminist, etc.) engaged Islamic exegetical, legal, philosophical, theological and mystical traditions to find answers to the questions raised by their historical and sociopolitical contexts. These questions included: What is/are the Islamic understanding(s) of the purpose of individual and collective lives? What does freewill mean in Islam, and what is its relationship to responsibility towards oneself and one's community? Is there an Islamic notion of justice, and how does it relate to the way justice is defined by other intellectual traditions? What are the legitimate ways of exercising social and political authority to establish the Islamic vision(s) of the good life? How is establishing that vision related to the notion of jihad (striving in the path of God)? What implications does that vision, and its concomitant notions of justice and freewill, have on developing an Islamic understanding of the relationship between different genders, classes, and human groups?

Prerequisite: Enrollment is restricted to graduate students.

POLI 261 - Key Issues in Contemporary Chinese Politics (5)

Addresses topics ranging from the core institutions of the party-state to local politics, economic governance, and state-society interactions in multiple realms. Considers China in its own terms while evaluating the relevance of theoretical concepts from various fields in the social sciences. Aims to identify opportunities for new research projects.

Prerequisite: Enrollment is restricted to graduate students.

POLI 270 - Advanced Topics in Global Environmental

Governance: Agency Beyond the State (5)

Explores if, how, and under what conditions agency and power are diffusing away from the state to non-state actors such as, NGOs/civil society, corporations, and international organizations.

Prerequisite: Enrollment is restricted to graduate students.

POLI 271 - Global Politics and Geo-Politics (5)

Explores global politics in relation to geo-political formations that are developing in concert with contemporary crises in capitalist globalization, but which are also shaped by a wide range of intersecting racial, sexual, environmental, national, and neocolonial politics as well.

Prerequisite: Enrollment is restricted to graduate students.

POLI 272 - Critical Interventions in IR Theory and Global Political Economy (5)

Seminar examines selections from the canonical literature in international relations theory and global political economy through a number of critical lenses, including constructivist, feminist, historical materialist, and subaltern approaches.

Prerequisite: Enrollment is restricted to graduate students.

POLI 275 - Contemporary Capitalism (5)

Examines genesis of new institutions within the force of social ties and networks. Studies how social and organizational relationships achieve individual or group goals in political and economic life, and influence institutional design. Considers when and what ties contribute to governance and economic performance, and when informal and formal organizations constitute an obstacle.

Prerequisite: Enrollment is restricted to graduate students.

POLI 291 - Teaching Assistant Seminar (2)

Two-hour weekly seminar required of teaching assistants in which pedagogic and substantive issues will be considered. The experience of performing teaching assistant duties constitutes subject matter for discussion. Students submit petition to sponsoring agency.

POLI 292 - Professional Development (2)

Primarily for first- and second-year graduate students. Students learn the norms and expectations of graduate school and a variety of professional roles. Students develop a plan for their graduate career and for establishing a professional network of mentors and peer audiences for their work.

Prerequisite: Enrollment is restricted to graduate students.

POLI 293 - Field Study (5)

Individual study undertaken off campus with direct faculty supervision. Students submit petition to sponsoring agency.

POLI 295A - Research Colloquium (2)

Weekly venue for Ph.D. students to present current research, exchange information on sources and resources, discuss and critique epistemologies and methods, and to formulate topics for QE field statements and the dissertation. There are no assigned readings. May be repeated for credit twice.

Prerequisite: Enrollment is restricted to graduate students.

POLI 295B - Advanced Research Seminar (5)

Weekly seminar for Ph.D. students in which to develop and write extended research papers on selected topics, to present current work, to discuss methods, data sources, and fieldwork, and to receive critiques and assessments from fellow students. May be repeated for credit twice.

Prerequisite: Enrollment is restricted to graduate students.

POLI 297A - Indep Study (5)

A student approaches a member of the staff and proposes to take POLI 297 on a subject he or she has chosen that is not covered in other politics graduate courses or plans a graduate independent study that includes an undergraduate course. Students submit petition to sponsoring agency.

POLI 297B - Indep Study (10)

A student approaches a member of the staff and proposes to take POLI 297 on a subject he or she has chosen that is not covered in other politics graduate courses or plans a graduate independent study that includes an undergraduate course. Students submit petition to sponsoring agency.

POLI 297C - Indep Study (15)

A student approaches a member of the staff and proposes to take POLI 297 on a subject he or she has chosen that is not covered in other politics graduate courses or plans a graduate independent study that includes an undergraduate course. Students submit petition to sponsoring agency.

POLI 299A - Thesis Research (5)

Enrollment restricted to graduate students and permission of instructor. Students submit petition to sponsoring agency.

POLI 299B - Thesis Research (10)

Enrollment restricted to graduate students and permission of instructor. Students submit petition to sponsoring agency.

POLI 299C - Thesis Research (15)

Enrollment restricted to graduate students and permission of instructor. Students submit petition to sponsoring agency.

PORT - PORTUGUESE

Lower-Division

PORT 1 - First-Year Portuguese (5)

Introduces first-year Portuguese language instruction and requires no previous study of Portuguese. Classes emphasize all language skills: listening, speaking, reading, and writing, including cultural competence.

PORT 2 - First-Year Portuguese (5)

Introduces first-year Portuguese language instruction. Classes emphasize all language skills: listening, speaking, reading, and writing, including cultural competence.

Prerequisite: Prerequisite(s): PORT 1 or by placement exam.

PORT 3 - First-Year Portuguese (5)

Course completes first-year Portuguese language instruction. Classes emphasize all language skills: listening, speaking, reading, and writing, including cultural competence.

Prerequisite: Prerequisite(s): PORT 2 or by placement exam.

PORT 65A - Accelerated Intermediate Portuguese (5)

A systematic grammar review is combined with literacy and cultural readings, while communicative exercises focus on improving students' ability to understand and hold sustained conversations. Students expand their vocabulary and knowledge of Brazil and other Portuguese-speaking cultures through films, popular music, and other culturally authentic materials.

Prerequisite: Prerequisite(s): PORT 3 or by consent of instructor.

PORT 65B - Accelerated Intermediate Portuguese (5)

Sequential to PORT 65A, completes second-year accelerated instruction. A systematic grammar review is combined with literacy and cultural readings, while communicative exercises focus on improving students' ability to understand and hold sustained conversations. Students expand their vocabulary and knowledge of Brazil and other Portuguese-speaking cultures through films, popular music, and other culturally authentic materials.

Prerequisite: Prerequisite(s): PORT 65A, or by consent of instructor.

PORT 80 - Voices from the Portuguese-Speaking World: Portugal, Brazil and Africa (5)

Examines key literary texts and films of the Portuguese-speaking world (Brazil, Portugal, and Africa), and the strategies they use to portray notions of national identity, which were transformed and enriched by transnational contact. Taught in English.

PORT 99 - Tutorial (5)

Students submit petition to sponsoring agency.

PORT 99F - Tutorial (2)

Students submit petition to sponsoring agency.

Upper-Division

PORT 199 - Tutorial (5)

Students submit petition to sponsoring agency.

PORT 199F - Tutorial (2)

Students submit petition to sponsoring agency.

PRTR - PORTER COLLEGE

Lower-Division

PRTR 1 - Academic Literacy and Ethos: Arts of Reading (5)

Teaches foundational concepts for intellectual exploration and personal development within an academic community: analysis, critical thinking, metacognition, engagement with others across difference, and self-efficacy. Engages Porter's intellectual tradition of investigating the contribution the arts and humanities make to a good life, a just society, and a flourishing world.

Prerequisite: Enrollment is restricted to first-year college members.

PRTR 1A - Introduction to University Life and Learning (1)

PRTR 1A explores opportunities, expectations, and responsibilities in university life. Topics include: academic planning; general education requirements; majors and minors; campus policy; and preparation for Porter's core course: Re/reading Race. Students gain familiarity with resources for health, well-being, time management, academic success, cultivating just communities, sexual harassment and violence prevention, reflection on UCSC's principles of community, and an introduction to the living and learning tradition of Porter College. This course can be taken for Pass/No Pass grading only.

Prerequisite: Enrollment is restricted to entering first-year Porter College students.

PRTR 2 - Reading Films for Truth (5)

Building on the foundational skills, habits of mind, and interpretive proficiencies developed in Academic Literacy and Ethos: Arts of Reading (PRTR 1), students will explore the ways in which feature-length narrative and documentary films have approached the representation of truth.

Prerequisite: Prerequisite(s): PRTR 1 or permission of instructor.

PRTR 26 - Navigating the Research University (2)

Explores critical engagement in education in the context of a research university. Introduces first-year issues and success strategies and ways to participate in the institution's academic life. Investigates strategies for clarifying education goals and

devising a plan for success. Students cannot receive credit for this course and KRSJ 26 or STEV 26.

Prerequisite: Enrollment is restricted to first-year Porter and Kresge College members.

PRTR 35M - The Mockumentary Film (5)

Mockumentaries such as *Waiting for Guffman*, *This is Spinal Tap*, and *Woody Allen's Zelig* grow out of the documentary tradition; but instead of claiming to represent real-world phenomena, they blatantly distort. Ten mockumentaries and their documentary correlates are studied. (Formerly course 80J.)

PRTR 37L - Introduction to Laser Cutting, 3D Printing, and Vacuum Forming (2)

Design functional objects, sculpture, and other digitally inspired forms in a variety of 2D (Illustrator) and 3D applications (Cinema 4D, Ketch UP, or AutoCAD), then produce those models as physical objects with a variety of rapid-prototyping methods including laser cutting, 3D printing, and vacuum forming.

Prerequisite: Enrollment is restricted to college members.

PRTR 41I - Improvisation (5)

Theory and practice of improvisation in the performing arts with an emphasis on acting improvisation techniques. Readings and films develop a theoretical and historical understanding of spontaneous invention on stage. Students attend area theater improvisational performances.

PRTR 41S - Solo Performance Works in the Theater (2)

Explores solo performance works made for the theater. While all course texts fall within the narrative tradition, some center on performers' lives, others on socio-political issues. Course participants screen video recordings of live performances in class., ultimately creating their own brief solo performances.

Prerequisite: Enrollment is restricted to college members.

PRTR 41W - Playwriting Workshop (2)

Explores different aspects of written drama: scene and character development, plot, dialogue, monologues, soliloquies, stage direction, setting, and structure. Excerpts of late 20th-century plays serve as the basis for class discussion.

Prerequisite: Enrollment is restricted to college members.

PRTR 47K - Korean Music and Culture (2)

Introduction to the farmers band tradition. Theory and practice of drumming are emphasized, resulting in a group performance.

PRTR 47S - Sound Art (2)

Several composers and performers of contemporary art music discuss the processes by which works are conceived in imagination, transcribed in notation, and realized in sound. After a brief introduction to contemporary music aesthetics, students attend a series of related presentations, seminars, and concerts.

Prerequisite: Enrollment is restricted to college members.

PRTR 51A - The Artist's Novel (2)

A cross-cultural survey of the *kunstlerroman*, or artist's novel, from its origins in late 18th-century Germany to contemporary Latin America and the United States, this course explores how this genre understands artistic development and the role of artists in society.

Prerequisite: Enrollment is restricted to college members or by permission of instructor.

PRTR 61 - Seminar in Arts (2)

Theoretical and historical aspects of the arts from one culture or world area are explored through seminar discussion, library research, and film/video presentations.

Prerequisite: Priority given to college members. Others by permission of instructor.

PRTR 61B - Handmade Books (2)

This workshop teaches the history and construction of handmade books as a mode of personal and/or political expression leading to an exhibition of student work.

Prerequisite: Enrollment is restricted to college members or by permission of the instructor.

PRTR 61J - Jewish Personal Narratives on Film (2)

Considers Jewish-American filmmakers as they come to terms with their identity in autobiographical works. Students write responses to texts and create their own brief personal narratives.

Prerequisite: Enrollment is restricted to college members.

PRTR 61N - Personal Narratives in Theater and Film (2)

Considers filmmakers and monologue performers as they come to terms with their identity in autobiographical works. Students write responses to texts and create their own brief personal narratives.

Prerequisite: Priority given to college members. Others by permission of instructor.

PRTR 61O - Documenting Oral History (5)

Students learn basic techniques of interview and camera work to document on film oral histories collected from community elders. Students develop their skills in writing, theater, visual art, music, or film to reinterpret oral histories as artwork.

Prerequisite: Priority given to college members. Others by permission of instructor.

PRTR 61Q - Queering the Arts (2)

Exploration of the arts as a way to understand and experience how queerness has been expressed, repressed, denigrated, and celebrated in visual arts, music, film, poetry, and dance.

Prerequisite: Enrollment is restricted to college members.

PRTR 63F - Fractals, Chaos Theory, and the Arts (2)

A consideration of chaos theory and fractal geometry as applied by 20th-century artists in all media. All necessary math and computer skills are covered. Students complete essays or art projects.

Prerequisite: Enrollment is restricted to college members.

PRTR 63W - Ways of Knowing (5)

Creativity in different disciplines is developed via different ways of knowing. Musical, visual, scientific, and spatial literacy demand understanding which is not primarily logocentric. Explores how practitioners of arts and science develop their work and conceptualize its execution.

Prerequisite: Enrollment is restricted to college members.

PRTR 71A - Awakening Compassion: Transforming Our Relationship to Self and the World (2)

Develops the qualities of compassion and kindness toward oneself and others. Combining contemporary scientific research, mindfulness training, and traditional contemplative practices, this course supports students in the cultivation of a more discerning, thoughtful, and compassionate life.

PRTR 90A - Aesthetics and Politics: Spanish Civil War (5)

Addresses questions of aesthetics and politics through a critical and practical examination of some artistic, literary, and broadly cultural developments proper to the political left during the Spanish Revolution and Civil War (1934-1939). Enrollment is restricted to first-year, Challenge Program participants from Stevenson College, Merrill College, Porter College, and Kresge College.

PRTR 90B - Art and Politics After Google (5)

Addresses questions of aesthetics and politics through a critical and practical examination of some artistic, literary, and broadly cultural developments proper to the history of the Internet (1990s to the present).

Prerequisite: Enrollment is restricted to participants in the first-year scholars program.

PRTR 93 - Field Study (5)

Field Study

PRTR 95A - Arts Education in the Community (5)

Organized in small teams, participants engage with students from public elementary classrooms to develop fully-staged group performance projects by end of term. Students are guided by instructor's models of teaching techniques, designed to stimulate the imagination, and by diverse readings.

Prerequisite: Priority given to college members. Others by permission of instructor.

PRTR 99 - Tutorial (5)

Various topics to be arranged. Students submit petition to sponsoring agency.

PRTR 99F - Tutorial (2)

Various topics to be arranged. Students submit petition to sponsoring agency.

Upper-Division**PRTR 131C - Curatorial Practice (2)**

Offers the opportunity to participate in programming interdisciplinary curatorial praxis, arts events, exhibitions, performances, lectures, and film screenings. Students are exposed to UCSC alumni and faculty members' research through visiting class lectures. Students learn basic protocol for arts programming and critical arts writing, and are required to create their own participatory curatorial project at Porter College.

Prerequisite: Enrollment is restricted to Porter College members.

PRTR 131P - What is Photography? History, Politics, and Critique of Photographic Representation (5)

We live in a world permeated with photographic images, but do we really notice photographs? Do we understand how they work and what they mean? Do we know how to read them? Now that our phones and cameras have merged, we might also say that we live in a world that is forever inviting, imploring us to take photos; we might say we live in a world in which it is almost impossible not to take photos. Are we all photographers now? Do we choose to take photographs or has photography, in a sense, chosen us?

PRTR 135W - Women and the Silent Screen: An Interactive history (5)

Students learn about women's engagement with early movie culture, conduct their own historical research, and collaborate on building a web site that brings this knowledge to a public audience.

Prerequisite: Enrollment is restricted to college members.

PRTR 141C - Shakespeare's Clown Characters (5)

This performance-based course explores Shakespeare's clowns, jesters, and fools (the characters as well as the performers who originated them). Examines the comic traditions from which Shakespeare drew his inspiration, and considers how Shakespeare's work continues to influence contemporary comedy practices. No experience with Shakespeare or performance is necessary.

Prerequisite: Enrollment is restricted to college members.

PRTR 141L - Long Form Improvisation (5)

Focuses on long-form (acting) improvisation, building participants' knowledge and skills through practical and theoretical readings, by viewing relevant performances, and by improvising in class and in small groups outside class. Participants perform in a final public showing.

Prerequisite: PRTR 41I or equivalent college-level experience or coursework.

PRTR 141W - Improvisation Workshop (5)

For practitioners of acting improvisation, this course deepens participants' knowledge and skills through practical and theoretical readings, by viewing performances, and by improvising in class and in small groups outside class. Participants perform in a final public showing.

Prerequisite: Prerequisite(s): PRTR 41I or equivalent college-level experience or coursework.

PRTR 145R - From Hamlet to Hamilton: Performing Rhythm and Rhyme in the Twenty-first Century (5)

This acting studio is an introduction to the skills needed in the performance of rhythmic and rhyming texts. Explores the similarities and differences in the use of rhythm and rhyme between Shakespeare and the contemporary playwright Lin-Manuel Miranda. No acting experience or audition is needed to enroll.

PRTR 147O - Opera Workshop/Music Practicum (2)

Rehearsal of the principal vocal parts of an opera in preparation for a full production. Consideration of the dramatic aspects of each role and the interrelationships of the characters.

PRTR 147P - Advanced Music Practicum (2)

The practice of music in a particular area of the world at an advanced level. Students learn the music of one world area or culture over the quarter and study the associated cultural background. Enrollment limited.

PRTR 151F - Writing the Future: Science Fiction (5)

Investigates how science fiction's utopic and/or dystopic projections give insights about equality, democracy, justice, and difference at the same time they register contemporary anxieties about community, kinship, war, viruses, genetic engineering, robotics, surveillance, and environmental degradation.

PRTR 151N - Tommy Orange and the New Native Renaissance (5)

Major figures in the New Native Renaissance (Tommy Orange, Terese Mailhot, and Billy-Ray Belcourt) are read to discover the contours of this new movement of indigenous literature. Course explores a wide range of new Native genres (memoir, poetry, short stories, and novels), but the central text is Tommy Orange's "There There," which critics have hailed as a central text in the revival of Native American letters.

PRTR 151P - Building the Poem: Process, Form, and the Embodied Text (5)

Investigates form as it guides poetic utterance. Students complete texts to fit forms including broadsides, pamphlets, and books. Composition is guided by production methods, from holographic texts to letterpress and digital composition.

Prerequisite: Enrollment is restricted to college members.

PRTR 151S - Introduction to Shakespeare (5)

Introduces Shakespeare's works, focusing on representative examples drawn from the range of genres in which he wrote; poetry, comedy, history, tragedy, and tragicomedy.

PRTR 161B - Handmade Books (5)

Teaches the construction and history of handmade books as artistic expression. Coursework covers a variety of structures, the analysis of book content, and the integration of design and concept. Covers the generation of content; explorations in typography; and folded, glued, and stitched structures.

PRTR 170A - Animal People: Vegans, Ethics, and Pop Culture (5)

Examines perceptions of vegans, critically questioning an array of negative stereotypes commonly associated with vegans and veganism. Also examines problems in mainstream veganism, such as white privilege, single-issue optics, consumerism, and perfectionism. Considers stigmas used to negate urgent planetary issues, such as animal ethics and animal exploitation, the impact of factory farming and animal agriculture on global climate change, and environmental racism and food apartheid. Students learn principles and practices of non-violent communication, build a theoretical vocabulary, develop their ability to understand and assess arguments, deepen their analytical skills and critical thinking abilities, and enhance their interpretative skills through writing assignments.

PRTR 171N - Nature in Indigenous American Culture (5)

Explores indigenous American relationships with other-than-human nature. Studies prehistoric through contemporary beliefs and practices. Emphasis on North America but may also include attention to Central or South American cultures' relationships with nature. Features films, writings, and artwork by indigenous American people.

Prerequisite: Prerequisite(s): Entry level writing and composition requirements.

PRTR 192 - Directed Student Teaching (5)

Teaching of a lower-division seminar by an upper-division student under faculty supervision. (See course 42.)

PRTR 193 - Field Study (5)

Field Study

PRTR 193J - The Literary Journal: Process to Product (5)

Provides a combination of theoretical background and hands-on experience in literary magazine editing and publishing. Students collaborate to produce a special Santa Cruz issue of Stone Soup, the for kids, by kids journal founded at Porter College. Enrollment is by permission of the instructor. Enrollment is restricted to sophomore, junior, and senior Porter college members majoring in art; art and design: games and playable media; art history; the history of art and visual culture; literature; or film and digital media.

PRTR 194 - Group Tutorial (5)

A program of independent study arranged between a group of students and a faculty instructor.

PRTR 198 - Ind Field Study (5)

Ind Field Study

PRTR 199 - Tutorial (5)

Tutorial

PRTR 199F - Tutorial (2)

Individual projects carried out under the supervision of a Porter faculty member. Students submit petition to sponsoring agency.

PSYC - PSYCHOLOGY**Lower-Division****PSYC 1 - Introduction to Psychology (5)**

Introduces prospective majors to the scientific study of behavior and mental processes and also provides an overview for non-majors. Emphasizes social, cognitive, developmental, and personality psychology and their interrelations.

PSYC 2 - Introduction to Psychological Statistics (5)

An introduction to elementary statistical principles and techniques relevant to psychological research. Topics covered include basic parametric and nonparametric statistics, analysis of variance, and simple factorial designs. This course is prerequisite to PSYC 181.

Prerequisite: Prerequisite(s): PSYC 1 or PSYC 20; and AM 3 or AM 6 or MATH 3 or MATH 4 or MATH 11A or satisfactory placement score on math placement exam or CEEB Advanced Placement Calculus AB exam.

PSYC 10 - Introduction to Developmental Psychology (5)

Addresses psychological development from conception through adolescence. Provides an overview of developmental psychology.

Prerequisite: Prerequisite(s): PSYC 1; and AM 3, or AM 6, or MATH 3 or higher level Mathematics course; and PSYC 2 or STAT 5 or STAT 7 and STAT 7L.

PSYC 20 - Cognition: Fundamental Theories (5)

Introduces basic concepts in cognitive psychology with a focus on theoretical explanations of cognitive functioning. Topics include perception, attention, memory, concepts, language, visual cognition, executive functions, and reasoning processes. (Formerly course 20A.)

PSYC 40 - Introduction to Social Psychology (5)

An analysis of contemporary research in social psychology and of what that research can teach us about the world we live in. Problems of conformity, propaganda, prejudice, attraction, and aggression. Focuses on a person's relationship with other

people, how he or she influences them and is influenced by them.

PSYC 60 - Introduction to Personality Psychology (5)

An overview of major personality theories from Freud to the modern day, and an introduction to contemporary research on personality development and assessment.

Prerequisite: Prerequisite(s): PSYC 1.

Upper-Division**PSYC 100 - Research Methods in Psychology (7)**

An introduction to research methods used to investigate human psychology. Course emphasizes critical thinking, designing and conducting research, analyzing and interpreting data, and writing a professional research report.

Prerequisite: Prerequisite(s): Entry Level Writing and Composition requirements; AM 3 or AM 6, or MATH 3 or higher level Mathematics course; and PSYC 2, or STAT 5, or STAT 7 and STAT 7L.

PSYC 101 - Topics in Developmental Psychology (5)

These topics, offered at different times by different instructors, examine selected topics in developmental psychology.

PSYC 102 - Adolescent Development: Adolescence into Young Adulthood (5)

Focuses on individual and relational development from early adolescence into emergin adulthood. Emphasis on the mutual influences of family relationships and adolescent development, and on the interface of family, peer group, and school experience in cultural contexts.

Prerequisite: Prerequisite(s): PSYC 10 and PSYC 100.

PSYC 103 - Adult Development and Aging (5)

Overview of the cultural, societal, biological, interpersonal, and cognitive processes of adult development and aging. Class discusses how each of these contexts and processes promotes stability and change as adults experience adulthood, reflect on their lives, and prepare for death.

Prerequisite: Prerequisite(s): PSYC 10 and PSYC 100.

PSYC 104 - Development in Infancy (5)

Focuses on psychological development in infancy. Presents research on perceptual, cognitive, and social-emotional development during the first two years of life.

Prerequisite: Prerequisite(s): PSYC 10 and PSYC 100. Enrollment is restricted to psychology and cognitive science majors.

PSYC 105 - Children's Thinking (5)

Cognition in children from infancy through adolescence. Basic and current research on children's understanding of the social and physical world. Focus on major theoretical perspectives:

especially Piaget's constructivist approach and sociocultural approach.

Prerequisite: Prerequisite(s): PSYC 10 and PSYC 100.
Enrollment is restricted to psychology and cognitive science majors and minors.

PSYC 106 - Social and Emotional Development (5)

An examination of contemporary theory and research on social and emotional development from infancy through childhood.

Prerequisite: Prerequisite(s): PSYC 10 and PSYC 100.

PSYC 107 - Gender and Development (5)

Examines the developmental psychology of gender in childhood and adolescence.

Prerequisite: Prerequisite(s): PSYC 10 and PSYC 100.
Enrollment is restricted to psychology majors.

PSYC 108 - Educational Psychology (5)

An overview of psychological theories and principles applied to formal and informal educational settings. Topics include: learning, motivation, cultural diversity, individual differences, and assessment. Students complete a research project.

Prerequisite: Prerequisite(s): PSYC 10 and PSYC 100.

PSYC 112 - Moral Development (5)

How and why do children develop into moral beings? This course covers key theories and empirical research about the cognitive, emotional, and behavioral aspects of moral development, including psychoanalytic, behaviorist, constructivist, nativist, and evolutionary approaches.

Prerequisite: Prerequisite(s): PSYC 10 and PSYC 100.

PSYC 114 - Human Development as a Cultural Process (5)

Examines interdisciplinary theory, research, and methods of studying the cultural basis of human development, and variations and similarities in human lives and practices in the United States and worldwide cultural communities.

Prerequisite: Prerequisite(s): PSYC 10 and PSYC 100.

PSYC 115 - Lifespan Developmental Psychopathology (5)

Examines theory and research on developmental psychopathology. Emphasizes the origin and longitudinal course of disordered behavior. Explores the processes underlying continuity and change in patterns of adaptation and age-related changes in manifestations of disorders.

Prerequisite: Prerequisite(s): PSYC 10 and PSYC 100.

PSYC 116 - Communication Technologies, Culture, and Human Development (5)

What is the role of Information Communication Technologies (ICTs) in human development and sociocultural change? Offers insights into how human cultures are changing with the proliferation of ICTs by examining how ICTs are incorporated

into cognitive, social, and identity development in late childhood through adulthood.

Prerequisite: Prerequisite(s): PSYC 10 and PSYC 100.

PSYC 117 - Child Advocacy (5)

Making children's lives better is the ultimate objective of the developmental scientists who study children's development and the professional practitioners who work with children and families. Course bridges basic and applied research in effort to redesign future policy and practice initiatives for children and families.

Prerequisite: Prerequisite(s): PSYC 10 and PSYC 100.

PSYC 118A - Children and War (5)

Examines the development and behavioral ecology of children affected by war. Discusses refugee children, displaced children, abandoned children, orphaned children, children living in protracted conflict, and child soldiers. Reviews child protection strategies and psychosocial intervention for war-affected children.

Prerequisite: Prerequisite(s): PSYC 10 and PSYC 100.

PSYC 118B - Children in Extreme Circumstances (5)

Reviews child survival in life-threatening contexts. Examines the lives of street children, institutionalized children, orphans, children in extreme poverty, enslaved children, war-affected children, abandoned children, and children whose parents have HIV/AIDS and other life-threatening illnesses.

Prerequisite: Prerequisite(s): PSYC 10 and PSYC 100.

PSYC 118C - Theory of Mind (5)

Reviews recent research on how children come to understand the human mind, such as desire, belief, goals, and intention. Also discusses the implications of this research on typically and atypically developing children.

Prerequisite: Prerequisite(s): PSYC 10 and PSYC 100.
Enrollment is restricted to psychology majors.

PSYC 118D - Growing Up in Panem: Developmental Psychology of the Hunger Games (5)

Uses The Hunger Games trilogy to explore contextual factors in child development and critically examine the parallels between Panem and the real world using psychology research. Topics include poverty, media, oppression, exposure to violence, resilience and resistance,

Prerequisite: Prerequisite(s): PSYC 10 and PSYC 100.

PSYC 119A - Development as a Sociocultural Process (5)

Examines theory and research in sociocultural approaches to how people (especially children) learn and develop through participating in activities of their communities with other people. Emphasizes the organization of social interactions and learning opportunities, especially in communities in the Americas where schooling has not historically been prevalent.

Satisfies the seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): satisfaction of Entry Level Writing, Composition requirements; PSYC 100, or ANTH 1 or ANTH 2, or EDUC 92A, or EDUC 92B, or EDUC 92C, or LALS 1, or SOCY 1. Enrollment is restricted to seniors or by permission.

PSYC 119D - Cultural Perspectives on Adolescent Development (5)

Examines cultural influences on adolescence from diverse cultural, ethnic, and socioeconomic communities from the perspective of current interdisciplinary theories and research. Topics include: identity development; changes from early adolescence to adulthood; links among family, school, peer, and community experiences; programs for youth; and implications of bridging research, social policy, and community practice. Includes research practicum. Satisfies the seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): PSYC 10 and PSYC 100 and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior psychology majors or permission of instructor.

PSYC 119E - The World of Babies (5)

Focuses on how infants learn about intuitive physics, naive psychology, and shared culture. Also discusses how cultural communities shape infants' learning. Satisfies the seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): satisfaction of Entry Level Writing and Composition requirements and PSYC 100. Enrollment is restricted to senior psychology and cognitive science majors.

PSYC 119F - Language Development (5)

An introduction to language development in young children. Explores current theory and research in language development; and focuses on the preschool years. Satisfies the seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): satisfaction of Entry Level Writing and Composition requirements, PSYC 10 and PSYC 100. Enrollment is restricted to senior psychology and cognitive science majors.

PSYC 119H - Children, Research, and Policy (5)

Explores ways that research in developmental psychology can be used to address real-world problems facing children. With an analytical focus on evidence and generalizability, we will investigate research-policy connections in topics of popular interest (e.g., child custody, poverty). Satisfies the senior seminar requirement. Satisfies the senior comprehensive requirement (Formerly Developmental Psychology Research and Real World Problems)

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements and PSYC 100. Enrollment is restricted to senior psychology majors.

PSYC 119I - Special Topics in Narrative Development (5)

Examines a special topic of current interest in developmental psychology centering on the features of self-identity that develop in the context of telling stories of individual and/or shared experiences, such as self-defining memories or family stories. Satisfies the seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; and PSYC 100; Enrollment is restricted to senior psychology majors. PSYC 60 recommended.

PSYC 119K - Emotional Development (5)

Covers classic and contemporary work on the nature and development of human emotions. Both theoretical perspectives and empirical research are discussed. Major topics include: emotion-cognition interplay, the measurement of emotion, universality and cultural variability, and emotional communication. Satisfies the senior seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): PSYC 10 and PSYC 100 and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior psychology majors.

PSYC 119L - The Development and Psychology of Cheating and Dishonesty (5)

Cheating and dishonesty occur in most human activities: academic assignments, sports, and politics. Most people have cheated or acted dishonestly at some point, even if they are honest most of the time. Why do humans sometimes decide to cheat or be dishonest? And how do we develop this tendency? This class covers developmental, cognitive, and social psychological perspectives on cheating, dishonesty, and integrity. Course covers classic research from the past century, as well as contemporary work and real-life cases. Satisfies the seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): PSYC 10 and PSYC 100; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior psychology majors.

PSYC 119M - Identity Development in Social and Cultural Contexts (5)

Senior seminar that focuses on identity development in adolescence and young adulthood. Discusses theory and research on the development of personal and social identities and the sociocultural contexts in which these personal and social identities are negotiated. Satisfies seminar requirement. Satisfies senior comprehensive requirement.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements and PSYC 100; PSYC 102 strongly recommended. Enrollment is restricted to senior psychology majors or by permission of instructor.

PSYC 119N - Hunger Games Seminar: Growing Up in Panem (5)

Uses The Hunger Games trilogy to explore contextual factors in child development and critically examines the parallels between Panem and the real world using psychology research. Satisfies the senior seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): PSYC 100 and satisfaction of Entry Level Writing, Composition requirements. Enrollment is restricted to senior psychology majors.

PSYC 119P - Children and Technology (5)

Covers current research and theory related to children and technology. Topics include: how children learn to use new technologies; how technology use impacts children's thinking; computer gaming and aggression; and how children's social relationships are influenced by technology. Satisfies the senior seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): PSYC 1, PSYC 10 and PSYC 100; and satisfaction of Entry Level Writing and Composition requirements. Enrollment is restricted to senior psychology and cognitive science majors.

PSYC 119Q - Perspectives on Autism (5)

Explores multiple perspectives on autism, highlighting those of autistic scholars, disability studies scholars, and philosophers. Satisfies the seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): PSYC 10, PSYC 100, and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior psychology majors.

PSYC 119S - The Developmental Psychology of Love (5)

Drawing upon key theoretical and empirical findings from across psychology's subfields, this course explores how the experience and expression of love evolves across the life course and how the unique contributions of both partners to relationship dynamics contour relationship trajectories. Satisfies the senior seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): PSYC 100; satisfaction of entry-level writing and composition requirements. Enrollment is restricted to senior psychology majors.

PSYC 119T - Media Contexts of Adolescent and Young Adult Development (5)

Focuses on the role of media in adolescents' and young adults' identity development, friendships, and peer relationships. Topics include: globalization; physical/body image; friendships and peer acceptance; and educational and career goals. Satisfies the senior seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, PSYC 10 and PSYC

100. PSYC 102 is recommended. Enrollment is restricted to senior psychology majors.

PSYC 120 - Visual and Spatial Cognition (5)

Focuses on high-level perception and visual, spatial, and other sensorimotor representations as elements of human cognition. Topics include imagery, visual attention, mental models, spatial language, the body schema, near-body space, and brain organization for representing space.

Prerequisite: Prerequisite(s): PSYC 100. Enrollment is restricted to cognitive science and psychology majors.

PSYC 120D - Deafness and Sign Language (5)

Explores what we can learn about human cognition by studying sensory loss and language in a different sensory modality. Topics include brain organization, sensory compensation, working memory, visual cognition, and psycholinguistics.

Prerequisite: Prerequisite(s): PSYC 1 or PSYC 20 or PSYC 20A, and PSYC 100. Enrollment is restricted to psychology and cognitive science majors and minors.

PSYC 121 - Perception (5)

Introduces the study of human perception. Topics include: the structure and function of the human eye and early visual cortex, perception of motion, color, and objects; recognition of faces; and audition, sensory integration, and synesthesia.

Prerequisite: Prerequisite(s): PSYC 100; and PSYC 20. Enrollment is restricted to psychology and cognitive science majors and minors.

PSYC 122 - The Science of Learning (5)

Academic success often entails managing and mastering multiple courses covering a variety of topics, each with their own unique requirements. However, what study methods are effective versus ineffective, and why? For example, is learning based on the amount of time a student spends studying? Is highlighting an effective method of learning? Is it better to study by reviewing notes or testing oneself? How will you know if a study tip you read on the internet will really help you learn? Course poses questions about studying and discuss the answers that have been uncovered through scientific research on human memory.

Prerequisite: Prerequisite(s): PSYC 20 or PSYC 122; and PSYC 100.

PSYC 123 - Cognitive Neuroscience (5)

An examination of the physiological mechanisms of psychological processes, including sensory systems, motor systems, control systems, and memory and learning. Principles of nervous system organization are discussed at each level.

Prerequisite: Prerequisite(s): PSYC 100. Enrollment is restricted to psychology and cognitive science majors and minors.

PSYC 124 - Psychology of Reading (5)

Focuses on the cognitive processes that underlie reading in adults. Additional topics include different writing systems, learning to read, and reading deficits. Recommended for upper-division students.

Prerequisite: Prerequisite(s): PSYC 100. Enrollment is restricted to psychology and cognitive science majors and minors.

PSYC 125 - The Psychology of Language (5)

An analysis of human communication as a function of psychological, linguistic, and social factors. Focuses on language comprehension and production, including the processing of sounds, words, syntax, semantics, pragmatics, and dialogue.

Prerequisite: Prerequisite(s): PSYC 100. Enrollment is restricted to psychology and cognitive science majors and minors.

PSYC 126 - Conversations (5)

Explores how conversations work and how speakers accomplish their goals in an interaction. Topics include conversational structure, turn-taking, politeness, and the functions and use of collateral signals, among others. Collateral signals include pauses in speech, words like um, uh, you know, and like, and processes, such as how words and utterances are produced. (Formerly PSYC 139G.)

Prerequisite: Prerequisite(s): PSYC 100. Enrollment is restricted to psychology and cognitive science majors.

PSYC 127 - Computer Mediated Communication (5)

Provides an introduction to cognition as it relates to how people communicate using computers and the Internet. Focuses on the cognitive and social aspects of communication.

Prerequisite: Prerequisite(s): PSYC 100. Enrollment is restricted to psychology and cognitive science majors and minors.

PSYC 128 - Human Factors (5)

Human factors psychology studies human-machine interaction and computer usability, and involves diverse topics including user requirements analysis, user interface design, implementation and evaluation.

Prerequisite: Prerequisite(s): PSYC 100. Enrollment restricted to psychology and cognitive science majors and minors.

PSYC 129 - Human Learning and Memory (5)

Examines basic theories, models, methods, and research findings in human memory. Both traditional and nontraditional topics are covered.

Prerequisite: Prerequisite(s): PSYC 100. Enrollment is restricted to psychology and cognitive science majors and minors.

PSYC 130 - Deception, Brain, and Behavior (5)

Focuses on behavioral and brain manifestations of deception. Topics include developmental changes that allow us to understand and to use deception, physical implications of lying expressed in the face, voice, posture, and brain activity. Also covers mechanical or behavioral techniques used in deceptive behavior, whether in the form of overt behavior or brain activity.

Prerequisite: Prerequisite(s): PSYC 100; and PSYC 20 or any upper-division cognitive course. Enrollment is restricted to psychology and cognitive science majors and minors.

PSYC 130D - Evolutionary Psychology (5)

Introduction to how evolutionary principles can help us understand origins of the human mind. Covers evolutionary approaches to cognitive, social, and developmental psychology with emphasis on how cognition has been shaped by natural selection.

Prerequisite: Prerequisite(s): PSYC 100.

PSYC 132 - Neural Modeling (5)

Introduces students to the use of computer simulations in experimental psychology. Students use existing software to explore topics in cognition such as learning, memory, and psycholinguistics. One upper-division course in cognitive psychology (courses 120-139) is recommended.

Prerequisite: Prerequisite(s): PSYC 100. Enrollment is restricted to psychology and cognitive science majors and minors.

PSYC 133 - Bilingualism from a Cognitive Perspective (5)

Provides in-depth discussion of bilingualism from a cognitive perspective. Psycholinguistic researchers who study bilingualism are interested in questions such as how to measure bilingualism, how the brain acquires more than one language, how bilinguals organize and manage two (or more) languages in one brain, and the consequences of the bilingual experience on cognition. Students are introduced to current research that investigates these topics as well as current controversies in the literature that are yet unresolved.

Prerequisite: Prerequisite(s): PSYC 100.

PSYC 135 - Feelings and Emotions (5)

Focuses on contemporary research in the psychology of human emotions. Special attention given to work in cognitive science, including psychology, linguistics, philosophy, and anthropology, on how emotions are central to understanding human action and mental life.

Prerequisite: Prerequisite(s): PSYC 100 and psychology and cognitive science majors and minors; or linguistics, philosophy, or anthropology majors.

PSYC 137 - Mind, Body, and World (5)

Psychologists primarily view the mind as being separate from the body, and the body as being separate from the external

world. This course questions this widely held position and explores the way that minds arise from individuals' bodily interactions with others and the world around them. Particular attention is paid to the role of human embodiment in language use and everyday cognition.

Prerequisite: Prerequisite(s): PSYC 100 and psychology and cognitive science majors; or linguistics, philosophy, or anthropology majors.

PSYC 138 - Computer Programming for the Cognitive Sciences (5)

Offers a practical introduction to computer programming for psychology and cognitive science students. Students learn simple and effective techniques for collecting, parsing, and analyzing behavioral data from behavioral experiments. Students create programs to present visual stimuli, collect keyboard responses, and then write response time and accuracy to datafiles on disk. Students then write new programs to extract information from the datafiles, perform statistical analysis, and present summaries of the findings. Students learn to use the Python programming language for cross-platform application development. No previous programming experience is necessary.

Prerequisite: Prerequisite(s): PSYC 1 or PSYC 20, and PSYC 100. Enrollment is restricted to psychology and cognitive science majors.

PSYC 138M - Introduction to Matlab Programming for the Cognitive Sciences (5)

Matlab is a powerful and widely used programming language to design stimuli, collect behavioral data, conduct statistical analyses, and visualize results. This course provides students with basic tools to use Matlab in a range of cognitive science applications. The course includes in-class coding, weekly assignments, and a term project in which students write a program to analyze, collect, or visualize a dataset or model a cognitive phenomenon. No previous programming experience is required. Topics include modeling of cognitive and neural processes and principal components analysis.

Prerequisite: Prerequisite(s): PSYC 20 and PSYC 100. Enrollment is restricted to psychology and cognitive science majors.

PSYC 139B - Consciousness (5)

Provides a psychological study of human consciousness. Aim is to explore the following questions: What is consciousness? Where does consciousness come from? What functions does consciousness have in everyday cognition? How do we best scientifically study consciousness? These issues are examined from the perspective of contemporary research in cognitive science. Satisfies seminar requirement. Satisfies senior comprehensive requirement.

Prerequisite: Prerequisite(s): Entry Level Writing and Composition requirements and PSYC 100. Enrollment is restricted to senior psychology, philosophy, anthropology, linguistics, and cognitive science majors.

PSYC 139D - Modeling Human Performance (5)

Hands-on experience using computational modeling to understand human cognitive-task performance by comparing simulated and human data. Satisfies senior seminar requirement. Satisfies senior comprehensive requirement. Enrollment restricted to senior psychology, cognitive science, computer science, and computer engineering majors, or by permission of instructor. Satisfies the senior seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): Entry Level Writing and Composition requirements; PSYC 100, and at least one of the following: PSYC 121, PSYC 123, PSYC 128, PSYC 129, PSYC 132, PSYC 138; or CSE 5J, CSE 11, CSE 14, CSE 103, CSE 140.

PSYC 139F - Psychology and Evolutionary Theory (5)

Human psychology is examined from the viewpoint of evolutionary theory, including perspectives from ethnology, anthropology, and neuropsychology. Upper-division students from diverse backgrounds are encouraged to enroll. Satisfies the senior seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): Entry Level Writing and Composition requirements and PSYC 100. Enrollment is restricted to senior psychology, anthropology, biology, philosophy, sociology, cognitive science, and feminist studies majors.

PSYC 139G - Eye-tracking: A Window into Cognition (5)

Examines eye-tracking as a valuable research method to study cognition. Research using this method has established that eye movements are closely linked to ongoing cognitive processes in the human brain. Course covers the use of this technique in research on reading, language comprehension, scene perception, visual search, infant cognition, and other areas of cognitive science. Students read and review journal articles, participate in class discussions, and analyze publicly available eye movement data for a final report due at the end of the quarter. Satisfies the seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): PSYC 20, PSYC 100, and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior psychology and cognitive science majors.

PSYC 139H - Weird Science (5)

Explores the relationship between science and pseudoscience from a cognitive psychological perspective, including discussion of collection and selection of data, statistical assessment of data, cognitive illusions, memory distortions, reasoning, and decision-making. Also highlights the dissemination of scientific knowledge. Satisfies seminar requirement. Satisfies the senior seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): satisfaction of Entry Level Writing and Composition requirements and PSYC 100. Enrollment is restricted to senior psychology and cognitive science majors.

PSYC 139J - Forgetting (5)

Explores forgetting as an essential and adaptive process in human memory. Topics include: intentional and unintentional forms of forgetting; the (re)constructive nature of memory; and cases of extreme remembering. Satisfies the senior seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): satisfaction of Entry Level Writing and Composition requirements and PSYC 100. Enrollment is restricted to senior psychology and cognitive science majors.

PSYC 139K - Face Recognition (5)

To navigate our social world, we need to extract a wealth of information from faces, including identity, expression, gaze, age, and gender. This seminar reviews current topics in face-recognition research, from cognitive, neuroscience, developmental, social, and computational perspectives. Satisfies the senior seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; and PSYC 1 or PSYC 20; and PSYC 100. Enrollment is restricted to senior cognitive science, neuroscience, and psychology majors.

PSYC 139L - Illusions (5)

Illusions arise when our perception differs from reality. In this course, students investigate the mechanisms of visual, auditory, and proprioceptive illusions as an approach to understand the capacities and limitations of our perceptual system. Satisfies the senior seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): PSYC 100, and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior psychology and cognitive science majors.

PSYC 139M - Human-Robot Interaction (5)

Explores the social and psychological processes underlying the design and evaluation of robotic systems that coexist with people. Topics include: current texts in the philosophy, psychology, and state-of-the art. Students develop new psychological explorations in human-robot interaction. Satisfies the senior seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): PSYC 100, and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior psychology and cognitive science majors.

PSYC 139N - Diversity in Cognitive Psychology (5)

Lists of influential contributors to cognitive psychology insufficiently represent the influence of more diverse, non-traditional scientists. This course profiles the life and work of women and minority scientists who've made well-documented contributions to cognitive psychology, as well as those who've received less recognition. Satisfies the senior seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): PSYC 1 and PSYC 100, and PSYC 20 or PSYC 105; and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior cognitive science or psychology majors.

PSYC 139P - Natural and Artificial Intelligence (5)

Introduces one approach used in artificial intelligence: deep learning. This approach is inspired by the architecture and processing of real neural networks. Students learn about the algorithms developed and their applications in simulating intelligence. Satisfies the senior seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): PSYC 20; and PSYC 100; and Entry Level Writing and Composition requirements. One upper-division cognitive course is strongly recommended. Enrollment is restricted to senior psychology and cognitive science majors.

PSYC 139Q - Analogy and Transfer (5)

Examines the cognitive processes involved in analogical reasoning (understanding one example, object, problem, or event in terms of another better-understood one) and the transfer of knowledge (applying knowledge from one situation to another). Although discussion includes analogical reasoning and transfer in "genius" or exceptionally creative moments, students primarily focus on all the ways in which the same cognitive processes of analogy and transfer support day-to-day learning, thinking, reasoning, and problem-solving. Satisfies seminar requirement. Satisfies senior comprehensive requirement.

Prerequisite: Prerequisite(s): PSYC 100 and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior psychology and cognitive science majors.

PSYC 139R - Social Frames of Memory (5)

Remembering is an activity that we often do with others, and shared representations of the past bind us to one another as couples, families, and nations. Remembering is a fundamentally social process. Topics include extended cognitive systems, conversational remembering, family reminiscence, how social networks shape how and what we remember, cognitive content biases supporting collective convergence, and the psychology of collective memory. This includes social representations of history and their biases, cultural tools for thought, intergenerational transmission, and collective future thought. Satisfies seminar requirement. Satisfies senior comprehensive requirement.

Prerequisite: Prerequisite(s): PSYC 100 and satisfaction of the Entry Level Writing and Composition requirements. PSYC 129 recommended. Enrollment is restricted to senior psychology and cognitive science majors.

PSYC 140B - African American Psychology (5)

Incorporates historical and conceptual foundations; issues of social psychology; individual and developmental processes; and adjustment and clinical issues. Readings expose students to attributes of African American culture that have an impact on the psychology of African Americans as well as methodological issues relevant to key psychological topics.

Prerequisite: Prerequisite(s): PSYC 100.

PSYC 140F - Mind, Society, and Culture (5)

Introduces how social, cultural, and historical contexts shape psychological experiences, including self-concept, perception, emotion, health, and behavior. Draws from theories and research in psychology, sociology, and anthropology to highlight cultural variations in national populations (e.g., North Americans, East Asians) and multicultural populations within the United States (e.g., working-class Americans, African Americans, Mexican Americans, Native Americans).

Prerequisite: Prerequisite(s): PSYC 100.

PSYC 140G - Women's Lives in Context (5)

Examines gender as a psychological and social factor that influences women's experiences in different contexts. Cuts across other areas of psychology by taking a women-centered approach. Emphasis also placed on understanding how intersections between gender, race and ethnicity, sexual orientation, socioeconomic status, etc., impact women's psychological well-being.

Prerequisite: Prerequisite(s): PSYC 100, or SOCY 3A. Enrollment is restricted to junior and senior psychology and sociology majors.

PSYC 140H - Sexual Identity and Society (5)

Addresses sexual and gender identity diversity in social, historical, and political context. Highlights current social justice issues and cultural ideologies related to sexual and gender identity diversity. Discusses social and scientific activism for sexual liberation; gay and lesbian identities and communities; sexuality beyond binaries and categories (e.g., bisexuality, pansexuality); asexuality; kink/fetish; transgender identities and sexualities; sexual fluidity and heteroflexibility; and queer sexual ethics and politics.

Prerequisite: Prerequisite(s): PSYC 100.

PSYC 140L - Women's Bodies and Psychological Well-Being (5)

Examines how women's bodily experiences (e.g., sexual objectification, violence, menarche, sexual health) are uniquely tied to their subordinate status and impacts their psychological well-being. Theories of gender inequality will address how social control directed at women's bodies through power relations embedded in societal institutions contributes to women's marginalized status. Enrollment restricted to junior and senior psychology, sociology, feminist studies, and community studies majors.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; and PSYC 100, or SOCY 3A, or FMST 100. Enrollment restricted to junior and senior psychology, sociology, feminist studies, and community studies majors.

PSYC 140M - Legitimizing (In)Equality: Attitudes, Beliefs, and

Social Policy (5)

Drawing on research in social psychology, political psychology, and critical policy studies, course examines how beliefs legitimize inequality, influence intergroup relations, and inform policy attitudes. Both hierarchy-enhancing and hierarchy-attenuating beliefs are reviewed.

Prerequisite: Prerequisite(s): PSYC 100. Enrollment is restricted psychology, community studies, legal studies, politics, and sociology students.

PSYC 140Q - Social Psychology of Gender (5)

Considers individual, interpersonal, and cultural influences on gender similarities and differences in thinking, motivation, and behavior. Emphasizes factors related to power and status inequalities between women and men.

Prerequisite: Prerequisite(s): PSYC 100.

PSYC 140T - Psychology of Trauma (5)

Overview of psychological theory and research on trauma and traumatic stress, including responses to childhood trauma (especially sexual abuse), combat, and natural disasters. Variety of theoretical frameworks presented, including developmental, cognitive, neuropsychological, clinical, and social/contextual.

Prerequisite: Prerequisite(s): PSYC 100 or permission of instructor.

PSYC 141 - Privacy and Surveillance (5)

Survey of theory and research on privacy and surveillance. Topics include: the functions of privacy; threats to privacy in multiple domains; the psychological impact of surveillance; historical and cultural differences in privacy and surveillance practices; and the relationship between privacy, surveillance, and social justice.

Prerequisite: Prerequisite(s): PSYC 100, or by permission of the instructor.

PSYC 142 - Psychology of Oppression and Liberation (5)

Provides theoretical frameworks for understanding interlocking systems of oppression from the perspective of the oppressed as well as the oppressor nationally and internationally. Goes beyond mainstream (traditional) psychology and emphasizes critical psychological perspectives that include micro- and macro-level theories of oppression; importance of ideology in oppressive systems; and theories of social change and liberation across contexts.

Prerequisite: Prerequisite(s): PSYC 100 or feminist studies, sociology, community studies, or politics majors.

PSYC 144 - Latinx Psychology (5)

Offers an overview of psychological frameworks and interdisciplinary research for understanding Latinx populations, behaviors, identities, and values systems related to their mental health. Examines socio-cultural contexts, best research practices, and culturally responsive strategies for working with Latinx communities.

Prerequisite: Prerequisite(s): PSYC 100.

PSYC 145 - Social Influence (5)

An advanced course for upper-division undergraduates interested in the study of the persuasion process. The course investigates common influence tactics and how those tactics are used in various settings.

Prerequisite: Prerequisite(s): PSYC 100.

PSYC 145D - Social Psychology of Autocracy and Democracy (5)

Humans are the only animal capable of living in both authoritarian and democratic regimes. Course explores the nature of these forms of social relationships with a goal of promoting democracy. Topics include: obedience to authority, conformity, self-justification, propaganda, power, and conflict resolution.

Prerequisite: Prerequisite(s): PSYC 100.

PSYC 146 - The Social Context (5)

A systematic analysis of the social and contextual determinants of human behavior, with special attention given to concepts of situational control, social comparison, role and attribution theories, as well as the macrodeterminants of behavior: cultural, historical, and sociopolitical context.

Prerequisite: Prerequisite(s): PSYC 100.

PSYC 147A - Psychology and Law (5)

Current and future relationships between law and psychology, paying special attention to gaps between legal fictions and psychological realities in the legal system. Topics include an introduction to social science and law, the nature of legal and criminal responsibility, the relationship between the social and legal concepts of discrimination, and the nature of legal punishment.

Prerequisite: Prerequisite(s): PSYC 100; and PSYC 40 is highly recommended prior to taking this course. Enrollment is restricted to psychology, pre-psychology, and legal studies majors.

PSYC 147B - Psychology and Law (5)

Continuing discussion of current and future relationships between law and psychology and to contrasting psychological realities with legal fictions. Special attention is given to the criminal justice system including crime causation, the psychology of policing and interrogation, plea bargaining, jury selection and decision making, eyewitness identification, and the psychology of imprisonment.

Prerequisite: Prerequisite(s): PSYC 147A.

PSYC 148 - Stereotyping, Prejudice, and Racism (5)

Introduction to and analysis of the social psychology of stereotyping, prejudice, and racism in the United States. Examines how individuals both perpetuate and experience these

phenomena, through the lens of race as a system of privilege and disadvantage.

Prerequisite: Prerequisite(s): PSYC 100. Crosslisted as: Enrollment is restricted to declared Critical Race and Ethnic Studies majors and Black Studies minors.

PSYC 149 - Community Psychology: Transforming Communities (5)

Introduces community psychology, a discipline that blends social psychology, sociology, and anthropology. Topics include levels of analysis, ecologies, prevention, intervention, feminisms, empowerment, sense of community, coalition building, and social justice and action.

Prerequisite: Prerequisite(s): PSYC 100. Enrollment is restricted to juniors and seniors.

PSYC 153 - The Psychology of Poverty and Social Class (5)

Examines how social class shapes attitudes, beliefs, and behaviors. Emphasis is placed on structural barriers and their impact on the well-being of low-income groups. Strategies for reducing classist discrimination, improving interclass relations, and strengthening social policy are discussed.

Prerequisite: Prerequisite(s): PSYC 100, or anthropology, community studies, economics, legal studies, politics, sociology, or feminist studies majors.

PSYC 155 - Social-Community Psychology in Practice (5)

This service-learning course requires time in the classroom and the field. Students gain a deep understanding of social justice paradigms, community-based collaborative research, ethics, field-based research, reflexivity, and socio-cultural development modes. Prerequisite(s): PSYC 3 or PSYC 100; PSYC 149 and PSYC 182 are recommended prior to taking this course. Admission by application and interview only.

PSYC 159A - Sexual Identity (5)

Considers the experience of lesbian, gay, bisexual, and transgender individuals from a psychological perspective. Reviews theory and research on compulsive heterosexuality, heterosexism and homophobia, culture and sexual-identity diversity, issues of history and community of LGBT individuals, and perspectives on sex, gender, and sexuality from queer theory. Satisfies the seminar requirements. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): PSYC 100, and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior psychology majors.

PSYC 159D - Psychology of Sexual Aggression (5)

An overview of psychological theory and research related to sexual aggression, focusing on both perpetration and victimization. Includes a discussion of the social construction of masculinity and femininity, media representations of sexual violence, and alternative (non-aggressive) visions of sexuality.

Satisfies the senior seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): Entry Level Writing and Composition requirements; and PSYC 100. Enrollment is restricted to senior psychology or feminist studies majors or permission of instructor.

PSYC 159E - Peace Psychology (5)

Is war inevitable? What is peace? Is it more than the absence of violence? Explore how psychology—the study of human behavior—can help to decrease violence and enhance cooperation at multiple levels including the personal, interpersonal, community, and international arenas. Satisfies the senior seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): Entry Level Writing and Composition requirements; and PSYC 100. Enrollment is restricted to senior psychology majors.

PSYC 159H - Community-Based Interventions (5)

Topics include: what makes a successful intervention; what happens before the formal intervention begins; the ethics involved with interventions; different methods for assessing interventions; and different praxis models. Satisfies the seminar requirement. Satisfies the senior comprehensive requirement. A service component is involved.

Prerequisite: Prerequisite(s): satisfaction of Entry Level Writing and Composition requirements and PSYC 100. Enrollment is restricted to senior psychology majors.

PSYC 159I - Psychology of Immigration (5)

Provides an overview of the social and cultural psychological study of immigrants in the United States. Examines the migration/immigration process; immigrants' social identities; schooling of immigrant youth; and impact of policy on the well-being of immigrants. Satisfies the senior seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): PSYC 100 and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior psychology majors.

PSYC 159J - Social Psychology of Social Justice (5)

Why do some situations seem fair and others unfair? Are all people concerned with justice or are some scoundrels? This course looks at the principles of distributive, procedural, and retributive justice and at real world applications of theories. Satisfies seminar requirement. Satisfies senior comprehensive requirement.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior psychology majors.

PSYC 159N - Psychology of Mentoring (5)

Looks at the psychological studies of mentoring. Examines empirical studies and connects those to lived experience.

Critical inquiry is stressed. Satisfies the senior seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements and PSYC 100. Enrollment is restricted to senior psychology majors.

PSYC 159P - Race, Ethnicity, and Environmental Inequality (5)

Examines racially and ethnically marginalized and dominant conceptions of the environment throughout U.S. history. Also explores events and policies revealing how human behavior shapes and is shaped by environmental inequality, and strategies for achieving environmental justice. Satisfies the seminar requirements. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): PSYC 100; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior psychology majors.

PSYC 159R - Achievement Disparities: A Social Psychological Perspective (5)

In this interactive seminar, we draw on research and theories in social and cultural psychology to examine persisting disparities in education and achievement for varying social groups (e.g., race/ethnicity, gender, social class) and to identify intervention strategies for reducing these disparities. Satisfies the senior seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): PSYC 100, and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior psychology majors.

PSYC 159S - Queer Intimacies (5)

Examines the science of relationship diversity through the lens of social psychology. Reviews popular and psychological literature on same-sex relationships, polyamory/consensual non-monogamy, kink/fetish/BDSM relationships, chosen families, asexuality, and transgender intimacy. Concludes with discussion of the impact of queer intimacies on heterosexuality. Satisfies the seminar requirements. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, and PSYC 100. Enrollment is restricted to senior psychology majors.

PSYC 159X - Psychology of Social Activism (5)

Covers social-psychological scholarship relevant to social justice activism that receives limited academic attention in conventional psychology. The seminar aims at understanding how knowledge gained in action-oriented research can be applied to social change. Satisfies the senior seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, and PSYC 100. Enrollment is restricted to senior psychology majors.

PSYC 165 - Systems of Psychotherapy (5)

A review of the major methods of psychotherapy most currently practiced, including ethical standards and dilemmas, and client-therapist-system variables affecting efficacy.

Prerequisite: Prerequisite(s): PSYC 100; PSYC 60 or PSYC 170 recommended.

PSYC 166 - Personality Assessment (5)

How do we really know a person? Provides experience assessing such individual differences as intimacy motivation, dominance, creativity, and well-being. Students construct their own personality test and learn to evaluate the kinds of self-report, observational, projective, and interview techniques used in organizational and clinical contexts.

Prerequisite: Prerequisite(s): PSYC 100; PSYC 60 highly recommended as preparation.

PSYC 167 - Clinical Psychology (5)

Serves as an in-depth introduction to the field of clinical psychology. Covers issues of clinical assessment, interviewing, testing, and a range of therapeutic modalities.

Prerequisite: Prerequisite(s): PSYC 100; PSYC 170 is recommended as preparation. Enrollment is restricted to psychology majors.

PSYC 168 - The Study of Dreams (5)

An overview of dream studies by several major theorists and researchers of the 20th century, including Freud, Jung, and Hall. An emphasis on studies that reveal cognitive conceptions and personal concerns through quantitative and qualitative analyses of sets of dreams from individuals and groups. Other topics covered more briefly include dream recall, children and dreams, and the role of dreams within cultures.

Prerequisite: Prerequisite(s): PSYC 100.

PSYC 169 - Community Mental Health (CMH) (5)

How can we improve mental health? Examines theory, method, and efficacy research of outreach, prevention, and intervention methods with various mental health populations in community settings (e.g., victims of sexual violence, new immigrants, those with severe mental illness, children in foster care). Presents characteristics of successful CMH agencies and programs and how to develop one's own agency or intervention model.

Prerequisite: Prerequisite(s): PSYC 100. PSYC 60 or PSYC 170 recommended.

PSYC 170 - Abnormal Psychology (5)

Survey of theory, research, and intervention in human psychopathology. Covers psychological, biological, developmental, and socio-cultural approaches.

Prerequisite: Prerequisite(s): PSYC 100; PSYC 60 highly recommended as preparation.

PSYC 171 - Childhood Psychopathology (5)

A critical and intensive exploration of a wide variety of specific disorders within their biological, developmental, and social contexts. Concepts of psychopathology in childhood, major and minor diagnostic systems, and a variety of theories of etiology are explored. General intervention strategies and a wide range of specific psychotherapy systems for treatment are closely examined and demonstrated.

Prerequisite: Prerequisite(s): PSYC 10 and PSYC 100. PSYC 170 strongly recommended.

PSYC 172 - Health Psychology (5)

Course examines the psychological aspects of health, illness and healing. Focuses primarily on etiology, treatment and prevention; specific topics include stress and the immune response, social support, compliance, health beliefs, and the healing relationship. (Formerly course 140C.)

Prerequisite: Prerequisite(s): PSYC 100.

PSYC 175 - Personality, Relationships, and Emotions (5)

Explores the reciprocal development of personalities and emotions/emotion regulation in the context of close relationships.

Prerequisite: Prerequisite(s): PSYC 100. PSYC 10 and PSYC 60 recommended as preparation.

PSYC 178 - Nutritional Psychology (5)

Explores the interactive relationship between nutrition and mental health. Includes a review of the research on the impact of different components of nutrition (e.g., protein, minerals, sugar) on the function of the brain, the nervous system, and the endocrine (hormone) system, and how that translates into changes in mood and cognitive capacity. Also explores the psychological factors that influence food choice and eating behaviors in the context of cultural beliefs and pressures.

Prerequisite: Prerequisite(s): PSYC 100; PSYC 170 is recommended as preparation. Enrollment is restricted to psychology majors.

PSYC 179A - Theories of Moral Psychology (5)

A seminar course with focus on theories of moral development from the psychoanalytic, social learning, cognitive-developmental, and humanistic perspectives. Students confront and discuss moral dilemmas from the four perspectives, working toward their own individual theories of pro-social behavior. Satisfies the senior seminar requirement. Satisfies the senior comprehensive requirement. Prerequisite(s): essay required on a moral issue or dilemma relevant to the student's life.

Prerequisite: Prerequisite(s): Entry Level Writing and Composition requirements; and PSYC 100. Enrollment is restricted to senior psychology majors.

PSYC 179B - Children and Divorce (5)

Explores history and psychology of divorce and the short- and long-term effects of divorce on children. Examines wide range of findings that have drawn diametrically opposed conclusions; delves into social attitudes and legal structures that have impeded and enhanced divorce transitions for children and parents; investigates future models for divorcing that are child-friendly and consistent with findings from newly emerging longitudinal research on children and divorce. Satisfies the senior seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): satisfaction of Entry Level Writing and Composition requirements; PSYC 100. Enrollment is restricted to senior psychology majors.

PSYC 179D - Psychological Interpretation (5)

Seminar explores analytic, Jungian, and object-relations interpretive systems in-depth, using qualitative research methods on film, music, literature, and art, as well as psychological measures such as TAT, dream, and interview protocols. Interprets psyche of author, audience, and engendering culture. Satisfies the senior seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): PSYC 100, and PSYC 60 or PSYC 165; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior psychology majors.

PSYC 179E - Psychology of Emotion (5)

Our emotions influence nearly everything we do—from how we perceive the world to how we connect with other people. The scientific study of emotion, or affective science, investigates how emotions shape our lives. What purpose do emotions serve? How do we regulate them? How do they color cognitive processes like memory? Course considers emotions from several levels of analysis, including their evolutionary basis, their associated physiological responses, and the behaviors they motivate. Students gain a scientifically informed understanding of daily emotions and insight into how scientists study them. Satisfies seminar requirement. Satisfies senior comprehensive requirement.

Prerequisite: Prerequisite(s): PSYC 100 and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior cognitive science and psychology majors.

PSYC 179F - The Path to a Science of Dreaming (5)

Focuses on the methods and empirical findings that led gradually to development of a neurocognitive theory of dreaming between 1953 and 2016. Emphasis is on the difficulties of adapting methods useful in studying waking thought to the study of dreaming, the counterintuitive nature of many of the findings, the importance of replicating new results, and the general lessons about the nature of science that can be drawn from this particular scientific odyssey. Satisfies the senior seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): PSYC 100 and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior psychology and cognitive science majors.

PSYC 179G - Child, Youth, and Family Assistance in the Community (5)

Allows students in psychology field study to conduct senior capstone projects on topics related to their service learning (field study). The seminar is devoted to creating projects related to community systems that address the needs of at-risk child, youth, and families. Students in the seminar should be pre-enrolled in PSYC 193. Satisfies the senior seminar requirement. Satisfies the senior comprehensive requirement.

Prerequisite: Prerequisite(s): satisfaction of Entry Level Writing and Composition requirements and PSYC 100. Enrollment is restricted to senior psychology majors.

PSYC 181 - Psychological Data Analysis (5)

Intermediate statistical methods widely used in psychology (e.g., ANOVA, ANCOVA, multiple-comparisons, bivariate correlation, multiple regression, repeated-measures), corresponding SPSS or R programs, and elements of measurement theory.

Prerequisite: Prerequisite(s): PSYC 100.

PSYC 182 - Qualitative Research Methods (5)

Designed to equip students with the ability to evaluate, conceive, and carry out psychological research. A variety of techniques (interpretive, phenomenological analysis, grounded theory and narrative inquiry) are examined and experienced. Students carry out research projects.

Prerequisite: Prerequisite: PSYC 100.

PSYC 183 - History and Systems of Psychology (5)

An overview of the history of psychology. Examines issues of paradigm and philosophy of science. Reviews central paradigms in the history of the discipline. Assumes a critical-historical approach, linking scientific knowledge produced to prevailing societal beliefs about mind and behavior.

Prerequisite: Prerequisite(s): PSYC 100.

PSYC 192 - Directed Student Teaching (5)

Teaching of a lower-division seminar (PSYC 42) under faculty supervision. Available only to upper-division or graduate students. Students submit petition to sponsoring agency.

PSYC 193 - Field Study (5)

Series designed to provide advanced psychology undergraduates opportunity to apply what they have learned in the classroom to direct experience in a community agency. Students earn academic credit by working as interns at a variety of psychological settings where they are trained and supervised by a professional within the agency. Faculty also supervise the students' academic work by providing guidance and helping them integrate psychological theories with their hands-on intern experience. A two-quarter commitment. Students submit

petition to sponsoring agency. Prerequisite(s): PSYC 3 or PSYC 100. Enrollment restricted to junior and senior psychology majors.

PSYC 193A - Developmental Field Study (5)

Work in a community-based setting while completing self-directed academic work focused in the developmental area under the guidance of a faculty member. Students submit petition to sponsoring agency; applications due one quarter in advance to the Psychology Field Study Office. Prerequisite(s): PSYC 3 or PSYC 100. Enrollment restricted to junior and senior psychology majors.

PSYC 193B - Cognitive Field Study (5)

Work in a community-based setting while completing self-directed academic work focused in the cognitive area under guidance of a faculty member. Students submit petition to sponsoring agency; applications due one quarter in advance to the Psychology Field Study Office. Prerequisite(s): PSYC 3 or PSYC 100. Enrollment restricted to junior and senior psychology majors.

PSYC 193C - Social Field Study (5)

Work in community-based setting while completing self-directed academic work focused in the social area under guidance of a faculty member. Students submit petition to sponsoring agency; applications due one quarter in advance to the Psychology Field Study Office. Prerequisite(s): PSYC 3 or PSYC 100. Enrollment restricted to junior and senior psychology majors.

PSYC 193D - Clinical/Personality Field Study (5)

Work in community-based setting while completing self-directed academic work focused in clinical or personality area under guidance of a faculty member. Students submit petition to sponsoring agency; applications due one quarter in advance to the Psychology Field Study Office. Prerequisite(s): PSYC 3 or PSYC 100. Enrollment restricted to junior and senior psychology majors.

PSYC 194A - Research Internship in Developmental Psychology (5)

Provides students with intensive experience conducting current research in developmental psychology. Students submit petition to sponsoring agency. (Formerly Advanced Developmental Research.)

PSYC 194B - Research Internship in Cognitive Psychology (5)

Provides students with intensive experience conducting current research in cognitive psychology. Students submit petition to sponsoring agency. (Formerly Advanced Cognitive Research.)

PSYC 194C - Research Internship in Social Psychology (5)

Provides students with intensive experience conducting current research in social psychology. Students submit petition to sponsoring agency. (Formerly Advanced Social Research.)

PSYC 194D - Research Internship Clinical Psychology (5)

Provides students with intensive experience conducting current research in clinical psychology. Students submit petition to sponsoring agency.

PSYC 195A - Senior Thesis (5)

Preparation of a senior thesis over one, two, or three quarters, beginning in any quarter. When taken as a multiple-term course extending over two or three quarters, the grade and evaluation submitted for the final quarter apply to each of the previous quarters. Students contemplating a senior thesis should have a superior academic record and be well prepared with a suitable background of previous coursework or independent study for performing their proposed research. Students must file a petition with the Psychology Office the quarter in which they would like to begin the thesis. Senior thesis petitions are available in the Psychology Department Office. Check with office for enrollment conditions.

PSYC 195B - Senior Thesis (5)

Preparation of a senior thesis over one, two, or three quarters, beginning in any quarter. When taken as a multiple-term course extending over two or three quarters, the grade and evaluation submitted for the final quarter apply to each of the previous quarters. Students contemplating a senior thesis should have a superior academic record and be well prepared with a suitable background of previous coursework or independent study for performing their proposed research. Students must file a petition with the Psychology Office the quarter in which they would like to begin the thesis. Senior thesis petitions are available in the Psychology Department Office. Check with office for enrollment conditions.

PSYC 195C - Senior Thesis (5)

Preparation of a senior thesis over one, two, or three quarters, beginning in any quarter. When taken as a multiple-term course extending over two or three quarters, the grade and evaluation submitted for the final quarter apply to each of the previous quarters. Students contemplating a senior thesis should have a superior academic record and be well prepared with a suitable background of previous coursework or independent study for performing their proposed research. Students must file a petition with the Psychology Office the quarter in which they would like to begin the thesis. Senior thesis petitions are available in the Psychology Department Office. Check with office for enrollment conditions.

PSYC 198 - Independent Field Study (5)

Provides psychology majors with the opportunity to apply what has been learned in the classroom to direct experience in a community agency outside the local community. Students earn academic credit by working as interns at a variety of psychological settings, where they are trained and supervised by a professional on site. Faculty also supervise the students' field study, providing guidance and help integrating psychological theories with their hands-on experience. Two-quarter commitment required. Admission requires completion of lower-division psychology major requirements; students submit petition to sponsoring agency. Applications are due one quarter

in advance to the Psychology Field Study Office. Enrollment restricted to junior and senior psychology majors.

PSYC 199 - Tutorial (5)

Individual directed study for upper-division undergraduates. Students must file a petition with the Psychology Office the quarter in which they would like to take the tutorial. Petitions may be obtained in the Psychology Department Office.

PSYC 199F - Tutorial (2)

Specialized study with individual faculty as psychology peer advisors. May not be applied toward major requirements. Students submit petition to sponsoring agency. Application and interview required during the previous quarter. Enrollment restricted to junior and senior psychology majors.

PSYC 199G - Tutorial (3)

Specialized study with individual faculty. May not be applied toward major requirements. Students submit petition to sponsoring agency.

Graduate

PSYC 201 - Teaching in Psychology (5)

Provides graduate students with practical teaching skills in the areas of developing and stating a general philosophy of teaching, course design, writing a course syllabus, assessment techniques, evaluation procedures, effective teaching strategies, and media use.

Prerequisite: Enrollment is restricted to psychology graduate students.

PSYC 202M - Introduction to Matlab (5)

Introduces the programming language Matlab, focusing on its data analysis, visualization, stimulus presentation, and data-collection tools. Students develop Matlab skills by completing weekly assignments and a term project. No previous programming experience is required.

Prerequisite: Prerequisite(s): PSYC 204 or by permission of the instructor. Enrollment is restricted to psychology graduate students.

PSYC 202R - Introduction to R (5)

Teaches students how to use the statistical programming language and environment R to load, analyze, simulate, and visualize data. Assumes a basic understanding of descriptive and inferential statistics, but no prior experience with programming.

Prerequisite: Enrollment is restricted to psychology graduate students, or by permission of the instructor.

PSYC 204 - Quantitative Data Analysis (5)

Intermediate statistical methods widely used in psychology (e.g., ANOVA, ANCOVA, multiple comparisons, repeated-measures) and corresponding SPSS or R programs.

Prerequisite: Enrollment is restricted to graduate students.

PSYC 205 - Categorical Data Analysis (5)

Application of statistical methods for analyzing binomial and multinomial response variables in survey and experimental designs. Topics include hypothesis testing, confidence intervals, assessing effect size, sample size requirements, and an introduction to logistic regression models. Data analysis applications use SAS, SPSS, and R.

Prerequisite: Prerequisite(s): PSYC 204 or by permission of the instructor. Enrollment is restricted to graduate students.

PSYC 210 - The Experimental Method in Social Psychology (5)

Explores the philosophy and practice of the experimental method in social psychology.

Prerequisite: Enrollment is restricted to graduate students.

PSYC 211A - Proseminar: Social Justice and the Individual (5)

Provides an introduction to social psychology, focusing on various individual-level social justice topics, including the self, social comparison, individual and collective identity, social historical and social structural determinants of behavior and various policy and social change-related issues.

Prerequisite: Enrollment is restricted to psychology graduate students; undergraduates planning graduate work in social psychology may enroll with permission of instructor.

PSYC 211B - Social Justice, Society, and Policy (5)

Provides an introduction to social psychology, focusing on empirical and theoretical developments related to social justice and group and intergroup dynamics. Topics include: prejudice and discrimination, power, collective action, and psychology's relationship to social policy.

Prerequisite: Enrollment is restricted to psychology graduate students. Undergraduates planning graduate work in social psychology may enroll with permission of instructor.

PSYC 211C - Communicating in Social Psychology (3)

Supports first-year social psychology graduate students in completing their first-year projects. Involves discussion of research methods, but the primary emphasis is on writing and presenting the APA-style report. Includes writing exercises as well as practice talks on the presentations that students give in colloquium. Because this is a workshop tailored specifically to each student, over the course of the quarter we will work collaboratively to discuss each others' work, read each others' drafts, and establish a challenging and supportive context for thinking, writing, and presenting. First- and second-year projects required to be reported in two ways: a manuscript approved and signed by the first (adviser) and second readers, and a presentation of the project in the colloquium.

Prerequisite: Enrollment is restricted to social psychology first-year graduate students, or by permission of instructor.

PSYC 213 - Special Topics in Social Psychology (5)

Focuses on particular issues of theoretical and practical importance in social psychology. Topics vary from year to year

and often concentrate on issues of social justice, social identity, intergroup relations, and social policy.

Prerequisite: Enrollment is restricted to graduate students.

PSYC 214A - Multivariate Techniques for Psychology (5)

Introduces multiple regression, analysis of covariance, and random coefficient models. Both methodological and statistical aspects of data analysis are discussed. Practical problems of estimating and testing in general linear models are addressed. Students gain experience in carrying out and interpreting analysis using SPSS and R.

Prerequisite: Prerequisite(s): PSYC 204. Enrollment is restricted to graduate students.

PSYC 214B - Advanced Multivariate Techniques for Psychology (5)

Introduces factor analysis and structural equation modeling (SEM). Develop skills in defining, estimating, testing, and critiquing models. Topics include the rationale of SEM, model identification, goodness of fit, and estimation. Learn how to use relevant software packages (R, SAS, LISREL, EQS, or AMOS) to conduct exploratory and confirmatory factor analyses and latent variable path analyses.

Prerequisite: Prerequisite(s): PSYC 214A.

PSYC 215 - Production and Comprehension of Spontaneous Communication (5)

Seminar on spontaneous communication. Typical topics include discourse markers (including historical origins, cross-linguistic borrowing, second-language learning, children's acquisition), enquoting devices, backchannels, and spontaneous written communication.

Prerequisite: Enrollment is restricted to psychology graduate students.

PSYC 220 - Special Topics in Human Memory (5)

Topics announced when offered. Seminars involve discussion and critical evaluation of current, historical, and interdisciplinary readings relevant to topic. Emphasis on development of research ideas.

Prerequisite: Enrollment is restricted to graduate students.

PSYC 221 - Visual Perception (5)

Seminar to study human perception, its methodology, and driving issues as illustrated by selected research topics (e.g., adaptation to unusual sensory environments). Where possible, parallels with other areas of psychology are drawn.

Prerequisite: Enrollment is restricted to graduate students.

PSYC 222 - Topics in Lexical Organization (5)

The recognition of words is a critical step in natural language processing. Discusses a range of contemporary issues related to the representation of a word and the access of this information from the perspective of psychology, linguistics, and artificial intelligence.

Prerequisite: Enrollment is restricted to psychology graduate students; undergraduates who have completed PSYC 124 may enroll with permission of instructor.

PSYC 224A - Proseminar: Cognitive I (5)

A proseminar reviewing current topics in cognitive psychology, designed to introduce new graduate students to the field.

Prerequisite: Enrollment is restricted to psychology graduate students.

PSYC 224B - Proseminar: Cognitive II (5)

A proseminar reviewing current topics in cognitive psychology, designed to introduce new graduate students to the field.

Prerequisite: Enrollment is restricted to psychology graduate students.

PSYC 224C - Proseminar: Cognitive III (5)

A proseminar reviewing current topics in cognitive psychology, designed to introduce new graduate students to the field.

Prerequisite: Enrollment is restricted to graduate students.

PSYC 225A - Introduction to Developmental Research I (3)

Examines the rationale and techniques of research in developmental psychology. Topics include theories and paradigms in developmental psychology; translating theoretical ideas into researchable hypotheses; diversity issues in sampling; and conducting ethical research. Multiple-term course; students receive 6 credits in the second quarter of attendance; the grade and evaluation submitted for the final quarter applies to both quarters.

Prerequisite: Enrollment is restricted to psychology graduate students or with instructor's permission.

PSYC 225B - Introduction to Developmental Research II (3)

Examines the rationale and techniques of research in developmental psychology. Topics include selecting appropriate research designs; measurement and statistical approaches for research problems; issues of validity; and communicating research findings. Multiple-term course; students receive 6 credits in the second quarter of attendance; the grade and evaluation submitted for the final quarter applies to both quarters.

Prerequisite: Prerequisite(s): PSYC 225A. Enrollment is restricted to psychology graduate students or with instructor's permission.

PSYC 225C - Introduction to Developmental Research III (5)

Focuses on drawing reasonable conclusions from research findings by working on students' first-year research projects and critiques of existing research.

Prerequisite: Prerequisite(s): PSYC 225A and PSYC 225B. Enrollment is restricted to developmental psychology graduate students or by permission of the instructor.

PSYC 227 - Contemporary Issues in Psychology of Language (5)

Special topics in thought and language are examined from the perspectives of cognitive science. Particular attention given to embodied experience and higher-order cognition.

Prerequisite: Enrollment is restricted to graduate students.

PSYC 230 - Research in Cognitive Psychology Seminar (5)

Colloquium series to study and critique research in cognitive psychology and cognitive science.

Prerequisite: Enrollment is restricted to psychology graduate students.

PSYC 231 - Research in Social Psychology Seminar (5)

Seminar to study, critique, and develop research in social psychology.

Prerequisite: Enrollment is restricted to psychology graduate students.

PSYC 232 - Evolution of Cognition (5)

Explores current research on evolution of human cognition, drawing on findings from other species and from the archaeological record. Topics include language, working memory, episodic memory, numerical abilities, and social cognition.

Prerequisite: Enrollment is restricted to graduate students.

PSYC 235 - Infant Development in Contexts (5)

Seminar on how contextual factors influence the development in infancy, especially on cognitive domains. Discusses at least four types of contextual factors: cultural, experiential, event, and interpersonal contexts.

Prerequisite: Enrollment is restricted to psychology graduate students.

PSYC 242 - Research in Developmental Psychology Seminar (5)

Seminar to study, critique, and develop research in developmental psychology.

Prerequisite: Enrollment is restricted to psychology graduate students.

PSYC 244A - Proseminar I: Cognitive and Language Development (5)

Explores major theories and research in the fields of cognitive development and language development. Begins with classic theorists, such as Piaget and Vygotsky, and proceeds to theories and research on topics of current interest.

Prerequisite: Enrollment is restricted to graduate students.

PSYC 244B - Proseminar II: Social and Personality Development (5)

An examination of contemporary theory and research on social and personality development across the lifespan.

Prerequisite: Enrollment restricted to graduate students.

PSYC 246 - Cultural Diversity in Human Development (5)

Examines cultural influences in development from the perspective of current theories and empirical research in developmental psychology and related fields (including social psychology, anthropology, sociology, history, education, and social policy). Focuses on understanding development in diverse cultural, ethnic, and socioeconomic communities by examining the interplay of social, cultural, institutional, and psychological processes.

Prerequisite: Enrollment is restricted to graduate students.

PSYC 247 - Special Topics in Developmental Psychology (5)

Focuses on particular issues of theoretical importance in developmental psychology. Topics vary from year to year. Particular issues in language, culture, cognitive, social, and personality development may be covered.

Prerequisite: Enrollment is restricted to graduate students.

PSYC 248 - Survey Methods (5)

Practicum to give students hands-on experience with survey methods by conducting their own survey on the topic of their choice. Course requires the survey to be conducted off campus at a local agency or program chosen by student with approval of instructor.

Prerequisite: Enrollment is restricted to graduate students.

PSYC 249 - Field Methodologies and Social Ethnography (5)

Designed to train graduate students in applied field methods. Emphasis is on gaining knowledge and experience with actual field methods, by conducting social ethnography in the community. Field research in community placements required.

Prerequisite: Enrollment is restricted to graduate students.

PSYC 250 - Prejudice and Social Relations (5)

Examines the ways in which the various branches of psychology have approached the issue of prejudice. Attention paid to the assumptions underlying each approach and their relation to core psychological ideas such as the self and emotion.

Prerequisite: Enrollment is restricted to graduate students.

PSYC 251 - Feminist Theory and Social Psychology (5)

Course bridges feminist theory and social psychological research to explore connections between theory covered and empirical studies on various topics in social psychology. Seminar format allows students opportunity for extensive discussion.

Prerequisite: Enrollment is restricted to graduate students.

PSYC 252 - Special Topics in Cognitive Psychology (5)

Focuses on particular issues in cognitive psychology. Topics vary from year to year. Particular issues in language, memory,

perception, cognitive modeling, cognitive neuroscience, and more are covered.

Prerequisite: Enrollment is restricted to graduate students.

PSYC 253 - Theory and Research in Intergroup Relations (5)

Examines, compares, and contrasts a variety of theories in intergroup relations while examining relevant empirical research. The relevance of both theory and research findings to contemporary social issues is explored.

Prerequisite: Enrollment is restricted to psychology graduate students; undergraduates considering graduate work in social psychology are encouraged to enroll with permission of instructor.

PSYC 254 - Psychology of Gender (5)

Course reviews recent theory, research, and applications in the psychology of gender. Developmental, social-psychological, cultural, and feminist approaches are emphasized.

Prerequisite: Enrollment is restricted to graduate students.

PSYC 255 - Qualitative Inquiry in Psychology (5)

A broad survey of qualitative inquiry in psychology. Presents epistemologies; reviews ethnography, interpretative-phenomenological analysis, grounded theory, interviewing and narrative analysis, discourse analysis, focus groups, thematic analysis, content analysis, intuitive inquiry; discusses disciplinary guidelines for reporting and reviewing qualitative research.

Prerequisite: Enrollment is restricted to graduate students.

PSYC 256 - Psychology of Social Class and Economic Justice (5)

Course examines the social psychological antecedents, correlates, and consequences of economic inequality in contemporary U.S. society. The impact of social class on attitudes, beliefs, and behaviors is assessed. Strategies for reducing classist discrimination, improving interclass relations, and strengthening social policy are discussed.

Prerequisite: Enrollment is restricted to graduate students.

PSYC 261 - Participatory Action Research (5)

Participatory Action Research (PAR) is a theoretical standpoint and collaborative methodology that is designed to ensure that those affected by the research project have a voice in that project. Topics include philosophies of science; defining and evaluating PAR; ethics; and reflexivity.

Prerequisite: Enrollment is restricted to graduate students.

PSYC 264 - Transnational Feminism, Development, and Psychology (5)

A transnational feminist lens examines international development as linked to broader ideologies that transform gender relations and enhance women's empowerment. A social-psychology framework brings theoretical and practical import to the issues and examines how research can contribute to social justice and women's human rights.

Prerequisite: Enrollment is restricted to graduate psychology students, or by permission of instructor.

PSYC 290B - Advanced Developmental Research and Writing (2)

Tailored to graduate students' interests among topics involving research and scholarship in sociocultural approaches to development, methods for research design, data collection, coding, and analysis, and preparing and reviewing grant proposals and journal manuscripts. Multiple-term course; students receive 6 credits in the third quarter of attendance; the performance evaluation and grade submitted for the final quarter applies to all three quarters.

Prerequisite: Enrollment is restricted to graduate students.

PSYC 290C - Professional Development (5)

Designed to aid advanced psychology graduate students with development of competence in professional activities (e.g., preparing a vita, making job and conference presentations, submitting and reviewing manuscripts and grant proposals, professional communication, career decisions).

Prerequisite: Enrollment is restricted to advanced psychology graduate students.

PSYC 290E - Grant Writing for Psychologists (5)

Discusses how to write and put together a grant proposal for psychological research, culminating in a completed proposal.

Prerequisite: Enrollment is restricted to psychology graduate students.

PSYC 293 - Field Study (5)

Student-designed and student-conducted research carried out in field settings.

PSYC 297A - Independent Study (5)

Independent study and research under faculty supervision.

PSYC 297B - Independent Study (10)

Independent study and research under faculty supervision.

PSYC 297C - Independent Study (15)

Independent study and research under faculty supervision.

PSYC 297F - Independent Study (2)

Independent study and research under faculty supervision. Enrollment is restricted to graduate students.

PSYC 299A - Thesis Research (5)

PSYC 299B - Thesis Research (10)

PSYC 299C - Thesis Research (15)

PUNJ - PUNJABI

Lower-Division

PUNJ 1 - First-Year Punjabi (5)

Provides students with an introductory knowledge of Punjabi language and Gurmukhi script. Develops skills in reading, writing, speaking, and listening. Also focuses on vocabulary and grammar with the goal of engaging in conversation in real-life situations.

PUNJ 2 - First-Year Punjabi (5)

Students enhance their skills in reading, writing, speaking and listening. Students are given systematic lessons on Punjabi grammar, vocabulary, and the social use of the language in different situations.

Prerequisite: Prerequisite(s): PUNJ 1 or placement by interview with instructor.

PUNJ 3 - First-Year Punjabi (5)

Designed to continue building and strengthening students' skills in reading, writing, speaking and listening of modern Punjabi. In addition to new vocabulary, students are introduced to Punjabi idioms, proverbs, modern/medieval poetry, letter writing, and more elaborate compositions.

Prerequisite: Prerequisite(s): PUNJ 2 or by consent of the instructor.

RUSS - RUSSIAN

Lower-Division

RUSS 1 - First-Year Russian (5)

Aural comprehension, speaking, reading, and writing. Recitation and laboratory. Elementary sequence (1-2-3) begins in the fall quarter only.

RUSS 2 - First-Year Russian (5)

Aural comprehension, speaking, reading, and writing. Recitation and laboratory. Students interested in this course who have not taken the prerequisite should meet with the instructor prior to the first class meeting.

Prerequisite: Prerequisite(s): RUSS 1 or by consent of instructor.

RUSS 3 - First-Year Russian (5)

Aural comprehension, speaking, reading, and writing. Recitation and laboratory. Students interested in this course who have not taken the prerequisite should meet with the instructor prior to the first class meeting.

Prerequisite: Prerequisite(s): RUSS 2 or by consent of instructor.

RUSS 94 - Group Tutorial (5)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Students submit petition to sponsoring agency.

RUSS 99 - Tutorial (5)

Students submit petition to sponsoring agency.

RUSS 99F - Tutorial (2)

Students submit petition to sponsoring agency.

Upper-Division

RUSS 194 - Group Tutorial (5)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Students submit petition to sponsoring agency.

RUSS 199 - Tutorial (5)

Students submit petition to sponsoring agency.

RUSS 199F - Tutorial (2)

Students submit petition to sponsoring agency.

SCIC - SCIENCE COMMUNICATION

Upper-Division

SCIC 100 - Science Communication for Scientists (5)

Teaches students to communicate effectively about science with the public. Students formulate research questions, identify and interview appropriate expert sources, integrate material into engaging works of creative nonfiction using techniques such as structure, description and voice, and work with peers and the instructor to analyze and improve their work. Focuses on writing as the primary vehicle for creative nonfiction expression about science across mediums. Taught in conjunction with SCIC 200. Students cannot receive credit for this course and SCIC 200. Enrollment is restricted to sophomores, juniors, and seniors and subject to interview with the instructor to confirm level of scientific training and writing experience. Contact the instructor to arrange the interview.

SCIC 104B - Field Sketching in Color (5)

Covers field-adapted color illustration techniques including watercolor, colored pencil, inkwash, and mixed media. Field trips to various natural environments provide opportunities to sketch plants, mammals, birds, insects, landscapes, and other subject matter. In addition to in-class assignments, students produce a field sketchbook and a final project. Appropriate for students with demonstrated interest in science illustration through previous course work in science and art or through extracurricular activity in the field or a strong desire to learn the

skills of the field. Enrollment process differs for Summer Session.

SCIC 106A - Introduction to Natural Science Illustration (5)

Introduction to graphite, pen and ink, coquille, and scratchboard, along with training in essential skills for creating accurate and dynamic scientific illustrations. Attention to the demands of the printing process along with basics of proportion, perspective, and composition. Appropriate for students with a demonstrated interest in science illustration through previous course work in science and art, or through extracurricular activity in the field, or a strong desire to learn the skills of the field.

SCIC 160 - Introduction to Science Writing (5)

A rigorous examination and practice of the skills involved in writing articles about science, health, technology, and the environment for the general public. Covers the essential elements of news writing and explanatory journalism, including developing a story idea, interviewing scientists, fact checking, composition, and editing of multiple drafts about scientific research.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and C1, C2 requirements. Enrollment is restricted to junior and senior physical and biological sciences majors.

SCIC 199 - Tutorial (5)

Students submit petition to sponsoring agency.

SCIC 199F - Tutorial (2)

Students submit petition to sponsoring agency.

Graduate

SCIC 200 - Introduction to Science Communication for Scientists (5)

Instructs science students in communicating about their work with the non-scientist public, including written, visual, and audio forms of communication. Enrollment is restricted to graduate students in science and engineering studies. Enrollment is by interview with the instructor to confirm level of scientific training and writing experience. Taught in conjunction with SCIC 100. Students cannot receive credit for this course and SCIC 100.

SCIC 201A - Reporting and Writing Science News (5)

A survey of the conventions of newspaper journalism and the special application of those conventions to scientific and technological subjects.

Prerequisite: Enrollment is restricted to graduate students formally accepted into the writing track of the Science Communication Program.

SCIC 201B - The Science Feature (5)

A survey of selected feature articles in the current national science magazines, with attention to strategy, level of

complexity, explanation technique, and style. Writing assignments include a publishable feature article.

Prerequisite: Enrollment is restricted to graduate students formally accepted into the writing track of the Science Communication Program.

SCIC 201C - Profile and Essay Writing (5)

A survey of science and nature profiles and essays. Purpose, content, form, and style are considered. Writing assignments include original profiles and essays on current issues in science, technology, and society.

Prerequisite: Enrollment is restricted to graduate students formally accepted into the writing track of the Science Communication Program.

SCIC 201D - Policy and Investigative Reporting (5)

Rigorous examination of techniques for reporting topics where science and technology meet public policy and society. Covers essential skills of investigative reporting, including obtaining documents through Public Records Act requests, using online reporting resources, and writing about ethical and legal issues.

Prerequisite: Enrollment is restricted to graduate students formally accepted into the writing track of the Science Communication Program.

SCIC 201E - Multimedia Science News (5)

Introduces web-media tools for reporting science stories and enhancing coverage for broad audiences, including video packages, narrated slideshows, podcasts, blogs, and still photography. Laboratory sections address skills for handling equipment and online editing.

Prerequisite: Enrollment is restricted to graduate students formally accepted into the writing track of the Science Communication Program.

SCIC 202 - Writing and Editing Workshop (5)

Theory and practice of writing and editing articles on scientific, medical, environmental, and technological subjects for newspapers, magazines, and special publications directed at non-technical readers.

Prerequisite: Enrollment is restricted to graduate students formally accepted into the writing track of the Science Communication Program.

SCIC 297 - Independent Study (5)

A media internship is completed with faculty tutorial assistance, to satisfy a need for the student when a regular course is not available. Enrollment restricted to graduate students formally accepted into the writing track of the Science Communication Program.

SCIC 297B - Independent Study (10)

Independent Study

SOCD - SOCIAL DOCUMENTATION

Graduate

SOCD 200 - Approaches to Social Documentation (5)

Comprehensive review and analysis of documentary strategies aimed at societal critique and social change, evaluating changes in argument, evidence, and process over development of the discipline.

Prerequisite: Enrollment is restricted to graduate students.

SOCD 201A - Introduction to Documentary Field Production and Editing (5)

Designed to provide supplemental instruction on specific topical and/or technical matters related to social documentation. Topics include technical standards and innovations within the field of social documentation, documentary subjects, location production, and/or the work of individual professional documentarians.

Prerequisite: Enrollment is restricted to social documentation graduate students.

SOCD 201B - Advanced Documentary Field Production and Editing (5)

Intensive directing and producing course that covers conceptualization, research, treatment and proposal writing, interview technique, camera, editing, production, and distribution.

Prerequisite: Enrollment is restricted to social documentation graduate students. Open to qualified undergraduates with permission of instructor.

SOCD 201C - Project Planning for the Social Documentary (5)

Workshop seminar in project planning focusing on the form and content of the documentary project; research and preproduction; technical, financial, and logistical plans; and coordination with subjects and resources.

Prerequisite: Enrollment is restricted to social documentation graduate students.

SOCD 202 - Multiple-Platform Social Documentary Production (5)

Introduction to social documentary genres including video, photography, new media and other mediums, which addresses social-scientific research and methodology in the context of these processes.

Prerequisite: Enrollment is restricted to social documentation graduate students.

SOCD 203 - Documentary Research Methods and Social Science Representation (5)

Designed to acquaint students with how social science research represents social reality and how social documentarians represent social reality. Designed to encourage comparison among different modes of social science research and between

social science and different modes of social documentation representations of social life.

Prerequisite: Enrollment is restricted to graduate students.

SOCD 204 - Ethnographic Writing and Social Documentation (5)

Graduate-level advanced seminar explores ways that seeing, hearing, and knowing are influenced by culture, power, race, and other factors. Readings emphasize how documentary subjects are constituted and known, addressing questions of epistemology, social constructivism, objectivity, and method.

Prerequisite: Enrollment is restricted to graduate students.

SOCD 292 - Special Topics (2)

Provides supplemental instruction on specific topical and/or technical matters related to social documentation. Topics include technical standards, artistic strategies, and innovations within the field of social documentation, documentary subjects, and/or work of individual professional documentarians.

Prerequisite: Enrollment is restricted to graduate students.

SOCD 293 - Studies and Practice for Social Documentation, Filmmaking, and New Media (5)

This thematic, graduate-level, hybrid, production/critical studies course provides opportunities to learn specific technical skills while engaging in the analysis and critical interpretations of cinema, social documentary, animation, art, television, and new media. Technical topics may include animation; motion graphics; interactive web media; and installation, editing, cinematography, and sound.

Prerequisite: Enrollment is restricted to graduate students in social documentation. Graduate students from other programs may enroll by permission of the instructor.

SOCD 294A - Production/Analysis/Editing (5)

Workshop seminar oriented toward actual fieldwork, production, and preparation for editing of the thesis project in the student's chosen genre. Techniques of collection and recording, analysis, preparation, and editing taught.

Prerequisite: Enrollment is restricted to social documentation graduate students.

SOCD 294B - Production/Analysis/Editing (5)

Workshop seminar oriented toward the editing and creative assemblage of the thesis project in the student's chosen genre. Techniques of preparation, exhibition, and editing taught.

Prerequisite: Enrollment is restricted to social documentation graduate students.

SOCD 294C - Production/Analysis/Editing (5)

Social documentation students in the final phase of completing their master's thesis receive guidance in shaping their projects, receive feedback, and are taught key elements of structure and narrative at a time when the demand for clarity and social documentation exposition is crucial.

Prerequisite: Prerequisite(s): SOCD 294A and SOCD 294B. Enrollment is restricted to social documentation graduate students.

SOCD 295 - Project Completion (5)

Individualized study for second-year graduate students working on and completing their final projects. Limited to students enrolled in the social documentation program during their final quarter of study.

SOCD 297 - Independent Study (5)

Study either related to a course being taken or a totally independent study. Enrollment restricted to graduate students. Students submit petition to sponsoring agency.

SOCD 297F - Independent Study (2)

Students submit petition to course-sponsoring agency. Enrollment restricted to graduate students.

SOCY - SOCIOLOGY

Lower-Division

SOCY 1 - Introduction to Sociology (5)

A systematic study of social groups ranging in size from small to social institutions to entire societies. Organized around the themes of social interaction, social inequality, and social change. Fulfills lower-division major requirement.

SOCY 3A - The Evaluation of Evidence (5)

Introduces students to major types of data and data analysis used in sociology. Designed to give students a foundation in understanding social science research articles, reports, and media reports used in political and policy debates. Topics include: general principles of research design, measurement, inductive and deductive modes of reasoning, experimental design, field work and ethnographic design, and reading and understanding basic quantitative forms of data and analysis.

Prerequisite: Enrollment is restricted to majors, proposed majors, and minors in sociology, global information and social enterprise, and Latin American studies/sociology combined.

SOCY 3B - Statistical Methods (5)

Introduces basic quantitative data analysis found in sociological research and policy reports. Topics include: inferential statistics, such as probability distributions, sampling, and testing; and descriptive statistics, such as measures of association, bivariate, and multivariate analysis. (Formerly course 103A.)

Prerequisite: Enrollment is restricted to majors, proposed majors, and minors in sociology, global information and social enterprise, and Latin American studies/sociology combined.

SOCY 10 - Issues and Problems in American Society (5)

Exploration of nature, structure, and functionings of American society. Explores the following: social institutions and economic structure; the successes, failures, and intractabilities

of institutions; general and distinctive features of American society; specific problems such as race, sex, and other inequalities; urban-rural differences. Fulfills lower-division major requirement.

SOCY 15 - World Society (5)

Introduction to comparative and historical sociology. Focuses on the global integration of human society. Examines social changes such as industrialization, globalization, colonial rule, and the rise of Islamic fundamentalism. Uses social theory (including ideas from Marx, Weber, and Adam Smith) to explore the making of institutions like the nation-state, the World Trade Organization, the World Bank, and the International Monetary Fund. Fulfills lower-division major requirement.

SOCY 30A - Introduction to Global Information and Social Enterprise Studies (5)

The first class in a three-quarter sequence that prepares students for designing social justice and sustainability projects using social-enterprise methodologies to transfer information and communications technologies (ICT) to community and non-governmental organizations. Tuesday's class topics include globalization, info-exclusion, social justice, information revolution, global civil-society networks, social entrepreneurship, and organizational assessment. Thursday's technical laboratory teaches students to develop practical ICT skills for working solidarity with community organizations in areas such as web design, graphic design, and digital networking.

SOCY 99 - Tutorial (5)

Directed reading and research. Petitions may be obtained from the Sociology Department Office. Ordinarily call numbers for this course will not be issued after the first week of instruction. Students submit petition to sponsoring agency.

Upper-Division

SOCY 105A - Classical Social Theory (5)

This intensive survey course examines the intellectual origins of the sociological tradition, focusing on changing conceptions of social order, social change, and the trends observed in the development of Western civilization in the modern era. Readings are all taken from original texts and include many of the classical works in social theory with special emphasis on the ideas of Marx, Weber, and Durkheim, which constitute the core of the discipline. Prerequisite(s): satisfaction of Entry Level Writing and Composition requirements.

Prerequisite: Prerequisite(s): satisfaction of Entry Level Writing and Composition requirements. Enrollment is restricted to junior and senior majors, proposed majors, and minors in sociology, global information and social enterprise, and Latin American studies/sociology combined.

SOCY 105B - Contemporary Social Theory (5)

Surveys major theoretical perspectives currently available in the discipline including functionalism, symbolic interactionism,

ethnomethodology, conflict theory, critical theory, neo-Marxism, and feminist theory.

Prerequisite: Prerequisite(s): SOCY 105A and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to junior and senior majors, proposed majors, and minors in sociology, global information and social enterprise, and Latin American studies/sociology combined.

SOCY 107A - Designing ICT Projects for Social Enterprise (5)

Covers designing doable ICT-based projects to support the goals of community and NGOs. Topics include: social entrepreneurship/enterprise case studies; step-by-step project design; integrating social and technical solutions; project management. Technical topics include: Internet resources; advanced web/database design; computer networks/maintenance. Prerequisite(s): SOCY 30A and by permission of instructor. (Formerly SOCY 30B.)

SOCY 107B - Project Implementation and Grant Writing for Social Entrepreneurs (3)

Covers conversion of ICT project into a fundable grant proposal for social justice, integration of social activism, entrepreneurship and justice, and implementation of project. Topics include: funders, proposal design, field methods, project assessment, innovative ICT applications, action research methods. (Formerly course 30C.)

Prerequisite: Prerequisite(s): SOCY 107A or SOCY 30B.

SOCY 107F - Digital Social Enterprise and Project Management (2)

Provides Everett Program Fellows with hands-on experience, working in teams, running a digital social enterprise and managing technology-linked projects implemented with student teams. Fellows work closely with faculty and staff of the Everett Program for Technology and Social change, managing and implementing all aspects of the program, including fundraising and financial administration, project planning and development, maintaining communication with community partners, and mentoring younger students in the project in their own technology learning and project implementation activities. Prerequisite(s): SOCY 30A, SOCY 107A, and SOCY 107B. Enrollment is by permission of the instructor.

SOCY 111 - Family and Society (5)

Focuses on the interaction between family and society by considering the historical and social influences on family life and by examining how the family unit affects the social world. Readings draw on theory, history, and ethnographic materials.

Prerequisite: Prerequisite(s): SOCY 1 or SOCY 10 or SOCY 15. Enrollment is restricted to sophomores, juniors, and seniors.

SOCY 113C - Topics in Civic Engagement (2)

Explores the historical origins of contemporary civic polarization through the decades of political, cultural, technological, and legal changes that have resulted in our current combative political environment.

Prerequisite: Enrollment is restricted to juniors and seniors.

SOCY 114 - Sports and Society (5)

Explores the interconnections between sports and society using sociological theories and methods. Topics include class, race, and gender; mass media and popular culture; political economy; education and socialization; leisure patterns (participants and spectators); globalization and cross-national comparisons.

SOCY 116 - Communication, Media, and Culture (5)

Examines media institutions, communication technologies, and their related cultural expressions. Focuses on specific ways the media—including media studies and criticism—operates as social and cultural factor. Contemporary theory or equivalent in related fields recommended.

Prerequisite: Prerequisite(s): SOCY 105A and SOCY 105B. Enrollment is restricted to junior and senior majors, and minors in sociology, global information and social enterprise, and Latin American studies/sociology combined.

SOCY 117E - Migrant Europe (5)

Introduction to questions of immigration, nationalism, and racism in contemporary Europe. Addresses colonial roots of migration to Europe; patterns of immigration and responses to immigrants across different European regions; and political movements led by immigrants and other people of color.

Prerequisite: Prerequisite(s): SOCY 1, or SOCY 10 or SOCY 15 or CRES 10 or LGST 10; or by permission of the instructor.

SOCY 117M - Immigration Enforcement and Deportations (5)

The intensification of immigration enforcement in the United States and the associated rise of mass deportations have reached the lives of millions of immigrants and local communities. Course covers the context, determinants, and consequences of enforcement and deportation practices.

Prerequisite: Prerequisite(s): SOCY 1 or SOCY 10 or SOCY 15 or LALS 1. Enrollment restricted to sophomores, juniors, and seniors.

SOCY 118 - Popular Music, Social Practices, and Cultural Politics (5)

Considers the role of popular music as a site of contemporary social practices and cultural politics. Examines the institutional organization and production of popular music, its cultural meanings, and its social uses by different communities and social formations. Also examines popular music as a vehicle through which major cultural and political debates about identity, sexuality, community, and politics are staged and performed.

Prerequisite: Prerequisite(s): SOCY 105A or SOCY 105B. Enrollment is restricted to juniors and seniors.

SOCY 119 - Sociology of Knowledge (5)

If people define things as real, they are real in their consequences, quipped W.I. Thomas. Surveys sociological theories about where and how knowledge comes from, and the

politics of knowledge, with reference to contemporary debates surrounding issues, such as climate change, genetics, and inequality.

Prerequisite: Prerequisite(s): SOCY 105A or SOCY 105B, or by permission of the instructor.

SOCY 120 - Gender, Race/Ethnicity, Sexuality and Cultural Politics (5)

Focuses on the role feminist discourses play in cultural politics emphasizing sex, sexuality, and sex work as related to gender, race, and class. Examines the relationship between academic and popular feminisms. Interrogates post-feminism, third-wave feminism, and generational differences in feminisms. Formerly Gender, Sexuality, and Cultural Politics.)

Prerequisite: Prerequisite(s): SOCY 126 recommended. Enrollment is restricted to junior and senior sociology, critical race and ethnic studies, feminist studies, global information and enterprise, and Latin America/sociology majors, proposed majors, and minors.

SOCY 121 - Sociology of Health and Medicine (5)

Analysis of the current health care crises and exploration of the social relationships and formal organizations which constitute the medical institution. Study of the political, economic, and cultural factors which affect the recognition, distribution, and response to illness.

Prerequisite: Enrollment is restricted to junior and senior majors and minors in biochemistry; biological sciences; community studies; critical race and ethnic studies; sociology; the Latin American studies/sociology combined majors; and proposed sociology majors.

SOCY 121G - Genomics and Society (5)

Teaches critical skills for analyzing the co-production of genomics and society. Examines issues at stake as societies across the world increasingly turn to genomic data to cure disease, solve crimes, regulate immigration, revitalize economies, and answer age-old questions about who we are.

Prerequisite: Prerequisite(s): SOCY 10 and SOCY 105B, or by permission of the instructor. Enrollment is restricted to juniors and seniors.

SOCY 122 - The Sociology of Law (5)

Explores the social forces that shape legal outcomes and the ways law, in turn, influences social life. Traces the history and political economy of American law; the relation between law and social change; how this relation is shaped by capitalism and democracy; and how class, race, and gender are expressed in welfare and regulatory law.

Prerequisite: Enrollment is restricted to majors and minors in legal studies, sociology, Latin American/sociology combined, and global information and social enterprise.

SOCY 123 - Global and Transnational Perspectives in Science

and Technology Studies (5)

Examines transnational dimensions of science, technology, and medicine, with special attention to knowledge production, scientific practices, and therapeutics outside of North America and Western Europe. Students develop a conceptual foundation to analyze the global scale and impacts of scientific research.

Prerequisite: Enrollment is restricted to junior and senior sociology, anthropology, biology B.A., biotechnology, history, legal studies, politics, biochemistry and microbiology, community studies, critical race and ethnic studies, feminist studies, and Latin American and Latino studies/sociology combined majors; and GISES minors.

SOCY 124 - Visual Sociology (5)

Learn to critically consume documentary, ethnographic film, photojournalism, and the genre of realism as these methods are increasingly used to describe the social world. Addresses theoretical, methodological, practical, and ethical issues of creating visual media. Optional media lab teaches students how to create visual products as well.

Prerequisite: Prerequisite(s): Enrollment is restricted to juniors and seniors.

SOCY 125 - Society and Nature (5)

A healthy society requires a stable and sustainable relationship between society and nature. Covering past, present, and future, the course covers environmental history of the U.S., the variety and extent of environmental problems today, and explores their likely development in our lifetimes.

Prerequisite: Enrollment is restricted to sophomore, junior, and senior majors, proposed majors, and minors in sociology, global information and enterprise, and Latin American studies/sociology combined.

SOCY 126 - Sex and Sexuality as Social Practice and Representation (5)

Explores social and cultural aspects of human sexuality and reproduction, including how and why meanings and behaviors are contested. Analyzes sexuality and reproduction as forms of social and political control as well as cultural expression and self-determination.

Prerequisite: Enrollment is restricted to junior and senior sociology, critical race and ethnic studies, feminist studies, Latin American/sociology combined, and global information and social enterprise majors, proposed majors, and minors.

SOCY 127 - Drugs in Society (5)

Explores the history of the use and abuse of consciousness-altering substances like alcohol and other drugs. Social-psychological theories of addiction are reviewed in tandem with political-economic analyses to identify the social conditions under which the cultural practices involved in drug use come to be defined as public problems. An introductory sociology course is recommended prior to taking this course.

Prerequisite: Enrollment is restricted to majors and minors in legal studies, sociology, Latin American/sociology combined, and global information and social enterprise.

SOCY 127P - Sociology of Drugs, Botanicals and Pharmaceuticals (5)

Engages the social, historical, and economic trajectories of the drugs, illicit and licit, botanical and pharmaceutical within U.S. society. Through an examination of case studies, and other texts of encounter, explores how international, state, and local actors mediate as interlocutors between globalized interests, local knowledges, and the molecules we have increasingly come to know, ingest, and incorporate.

Prerequisite: Prerequisite(s): SOCY 1 or SOCY 10 or SOCY 15 or CRES 10; or by permission of the instructor. Enrollment restricted to junior and senior sociology, biology, biotechnology, biochemistry and molecular biology, community studies, critical race and ethnic studies, Latin American/sociology combined, and global information and social enterprise majors, proposed majors, and minors.

SOCY 128 - Law and Politics in Contemporary Japan and East Asian Societies (5)

Introduction to contemporary analysis of Japan's race relations, ethnic conflicts, and a government's failure to restore remedial justice for war victims in Japan, Asia, and the U.S. Specific issues include comfort women, national or state narratives on Hiroshima, forced labor during World War II, and Haydon legislation that allows war victims to sue the Japanese government and corporations in California.

Prerequisite: Enrollment restricted to sophomore, junior, and senior majors, proposed majors, and minors in legal studies, sociology, community studies, Latin American/sociology combined, global information and social enterprise, and critical race and ethnic studies.

SOCY 128A - Research Methods in Legal Studies and Critical Criminology (5)

Introduces survey research methods including problem formulation, research design, instrument construction, data collection, codification, data processing, computer analyses, and report writing. The greater emphasis is placed on statistical analyses and questionnaire constructions.

Prerequisite: Enrollment is restricted to sophomores, juniors, and seniors.

SOCY 128C - Social History of Democracy, Anarchism, and Indigenism (5)

Provided an overview of socio-political theories and thoughts from Athenian Direct Democracy in 500 BC, to Classical Liberalism, Social Contract, Libertarian Socialism, Anarcho-Syndicalism, Neo-Liberalism, Anarcho-Primitism, and lastly Indigenism in relation to the revival of indigenous knowledge, the Mother Earth law, and the restoration of the nature's rights as espoused by many governments in the Third World today.

Prerequisite: Prerequisite(s): SOCY 1, SOCY 10, or SOCY 15. Enrollment restricted to sophomore, junior, and senior

sociology, critical race and ethnic studies, community studies, legal studies, Latin American/sociology combined, and GISES majors, proposed majors, and minors.

SOCY 128I - Race and Law (5)

An introduction to comparative and historical analyses of the relation between race and law in the U.S. Emphasis on examinations of continuous colonial policies and structural mechanisms that help maintain and perpetuate racial inequality in law, criminal justice, and jury trials. (Formerly Race and Justice)

Prerequisite: Enrollment restricted to sophomore, junior, and senior majors, proposed majors, and minors in legal studies, sociology, community studies, Latin American/sociology combined, global information and social enterprise, and critical race and ethnic studies.

SOCY 128J - The World Jury on Trial (5)

Adoption of the jury and its varied forms in different nations provides ideal opportunities to examine differences between systems of popular legal participation. Course considers reasons why the right to jury trial is currently established in Japan or Asian societies, but abandoned or severely curtailed in others. American jury contrasted with other forms of lay participation in the legal process.

Prerequisite: Enrollment restricted to sophomore, junior, and senior majors, proposed majors, and minors in legal studies, sociology, community studies, Latin American/sociology combined, global information and social enterprise, and critical race and ethnic studies.

SOCY 128M - International Law and Global Justice (5)

Examines war crimes, crimes against humanity, and the evolution and role of the International Criminal Court (ICC). Examines the evolution of the concept of international law, the rationale for its birth and existence, roots of international conflicts and genocides, possible remedies available to victims, mechanisms for the creation and enforcement of international legal order, as well as the role of colonialism, migration, poverty, race/ethnic conflicts, gender, and international corporations in creating and maintaining conflicts and wars.

Prerequisite: Enrollment restricted to sophomore, junior, and senior majors, proposed majors, and minors in legal studies, sociology, community studies, Latin American/sociology combined, global information and social enterprise, and critical race and ethnic studies.

SOCY 129 - Popular Culture and Cultural Studies (5)

Examines the hidden politics of popular pleasure, studying the workings of domination and transgression in popular culture and everyday life. Explores not only media representations but cultural practices as well. Examines both cultural production and consumption. Considers how hegemonic discourses render the politics of resistance invisible.

Prerequisite: Prerequisite(s): SOCY 105A or SOCY 105B. Enrollment is restricted to junior and senior majors and minors

in sociology, global information and social enterprise, and Latin American studies/sociology combined.

SOCY 130 - Sociology of Food (5)

Following food from mouth to dirt, explores the politics, economy, and culture of eating, feeding, buying, selling, and growing food. Topics cover both the political economy of the food system as well as how body and nature are contested categories at either end of this system.

Prerequisite: Enrollment is restricted to juniors and seniors. Enrollment is restricted to sociology majors, proposed majors, and minors in sociology, global information and social enterprise, and Latin American studies/sociology combined majors.

SOCY 131 - Media, Marketing, and Culture (5)

Explores relationship between modern forms of cultural production and the economy and society in which they emerge. Course reads, screens, and discusses variety of the cultural texts: from the historical and theoretical to the commercial, popular, and counter-cultural.

Prerequisite: Enrollment is restricted to junior and senior majors, proposed majors, and minors in sociology, global information and social enterprise, community studies, and Latin American studies/sociology combined.

SOCY 132 - Sociology of Science and Technology (5)

Reviews social and cultural perspectives on science and technology, including functionalist, Marxist, Kuhnian, social constructionist, ethnographic, interactionist, anthropological, historical, feminist, and cultural studies perspectives. Topics include sociology of knowledge, science as a social problem, lab studies, representations, practice, controversies, and biomedical knowledge and work.

Prerequisite: Enrollment is restricted to junior and senior majors/minors in sociology; biology; biochemistry; community studies; critical race/ethnic studies; global information/social enterprise; Latin American studies/sociology combined; proposed sociology majors.

SOCY 133 - Currents in African American Cultural Politics (5)

Takes as its subject, the dialogues, debates, conceptions, and strategies of self representation produced by blacks in the U.S. and Atlantic world in the twentieth and twenty-first centuries. These issues are examined through the insights of feminist theory, cultural studies, media studies, sociology, and African American studies.

Prerequisite: Enrollment is restricted to juniors and seniors.

SOCY 134 - Television and the Nation (5)

The role of American network television in the production of the post-war American national imagination is our focus. Our approach will explore issues of media power, especially television's industrial apparatus, its network structure, its strategies of representation in relationship to the construction of

the image of the nation, and the meaning of citizens, consumers, and audiences.

Prerequisite: Enrollment is restricted to junior and senior majors and minors in sociology, Latin America and Latino studies/sociology combined, global information and social enterprise studies, history, literature, and film and digital media.

SOCY 135 - Healing Justice (5)

This experiential course explores the theoretical foundations, history, and future of healing justice as a framework using an embodied approach. Healing justice has shaped wide-ranging fields, from grassroots organizing and holistic health, to grant-making, and education. While the framework informs a dynamic movement, healing justice is grounded in consistent commitments like collective healing; centering Black, indigenous and people of color knowledges; and more that guide this course. Grounded in somatic or embodied inquiry, students engage various materials—from academic articles to poetry—using some of the restorative practices that are central to healing justice work.

Prerequisite: Prerequisite(s): SOCY 105A and SOCY 105B, or by permission of the instructor.

SOCY 136 - Social Psychology (5)

Major theories and concepts in sociological study of social psychology. Topics include identity and social interaction, deviance, sociology of emotions, social narratives, and the social construction of reality.

Prerequisite: Enrollment is restricted to junior and senior sociology and Latin American studies/sociology majors and proposed majors, and sociology and global information and social enterprise minors.

SOCY 137 - Deviance and Conformity (5)

Why certain social acts are considered threatening and how individuals or groups become stigmatized. Sociological analysis of the institutions and processes of social control and the experience of becoming deviant and living with a stigmatized identity. Introductory course in sociology recommended.

Prerequisite: Enrollment is restricted to junior and senior sociology majors, minors, and proposed majors, global information and social enterprise studies minors, and Latin American and Latino studies/sociology combined majors and proposed majors.

SOCY 139 - Field Research Methods (5)

Research practicum which examines methods and problems of qualitative field research both through examining literature published in this tradition and by carrying out directed field exercises. Students also design and carry out their own research project.

Prerequisite: Prerequisite(s): SOCY 3A.

SOCY 139D - Critical Digital Methods (5)

Introduces critical digital methods to examine ethical and epistemological concerns with Big Data, archives and digital

collections, organizational records, mobile ethnographies, social media, and crowd-sourced data. Students use open-source text mining and data-visualization programs.

Prerequisite: Prerequisite(s): SOCY 1, SOCY 10, or SOCY 15; and SOCY 3A. Enrollment is restricted to junior and senior sociology, Latin American and Latino studies/sociology, and global information and social enterprise majors, proposed majors, and minors.

SOCY 139G - Introduction to Geographic Information Systems (GIS) (5)

Introduces Geographic Information Systems (GIS) including methods to analyze geographic data and create maps. Students learn software, such as Google Map APIs and Bing Maps APIs, and focus on the ArcGIS mapping software. A course in statistics is recommended as preparation.

Prerequisite: Enrollment restricted to junior and senior anthropology, environmental studies, sociology, Latin American and Latino studies/sociology combined, and GISES majors, proposed majors, and minors; other majors by permission of instructor.

SOCY 139T - Community-Engaged Research Practicum (5)

Covers the theories and methods associated with community-based and participatory action research. Students review relevant scholarship then engage in a collective field research project in collaboration with a community organization. Themes, collaborations, and research projects vary. Enrollment is by permission of the instructor.

SOCY 140 - Social Psychology of Power (5)

This course uses historical, sociological, and social psychological materials to introduce students to issues concerning class and power, religion and power, minorities and power, women and power, the rise of the New Right, and the successes and failures of the Left.

Prerequisite: Prerequisite(s): SOCY 1, SOCY 10, SOCY 15, or PSYC 40. Enrollment is restricted to juniors and seniors.

SOCY 141 - Social Welfare (5)

Familiarizes students with the major social welfare programs and policies in the U.S., exploring changes in conceptualizations of social welfare, and offering a critical perspective on the present-day welfare state.

Prerequisite: Prerequisite(s): Two courses chosen from SOCY 1, SOCY 10, and SOCY 15. Enrollment is restricted to sophomore, junior, and senior majors, proposed majors, and minors in sociology, global information and social enterprise, and Latin American studies/sociology combined.

SOCY 142 - Language and Social Interaction (5)

Concerns the routine and taken-for-granted activities that make up our interactions with one another, consisting in large part—but not exclusively—of verbal exchanges. Emphasis on the socially situated character of communication, whether intimacy between two people or dominance of a group.

Prerequisite: Enrollment is restricted to junior and senior majors, proposed majors, and minors in sociology, language studies, linguistics, global information and social enterprise, and Latin American studies/sociology combined.

SOCY 145 - Sociology of Masculinities (5)

Examines conflicting views on the development and state of modern masculinity as adaptation, transitional phase, or pathology. Did men lose the gender war? Do boys need rescuing? What are common and divergent social experiences of men within race, class, gender, culture, era? An introductory sociology course recommended.

Prerequisite: Enrollment is restricted to junior and senior majors, proposed majors, and minors in sociology, psychology, global information and social enterprise, and Latin American studies/sociology combined majors.

SOCY 148 - Educational Inequality (5)

Examines educational inequality in the United States, focusing on contemporary debates and issues, especially in the California context. Covers schooling from preschool to higher education, and examines educational inequality from a system, setting, and individual-level perspective.

Prerequisite: Prerequisite(s): SOCY 3A and SOCY 3B, or by instructor permission. Enrollment restricted to junior, senior majors, proposed majors, and minors in sociology, education, global information and social enterprise, and Latin American studies/sociology combined.

SOCY 149 - Sex and Gender (5)

Modern analyses of sexuality and gender show personal life closely linked to large-scale social structures: power relations, economic processes, structures of emotion. Explores these links, examining questions of bodily difference, femininity and masculinity, structures of inequality, the state in sexual politics, and the global re-making of gender in modern history. Recommended as background: any lower-division sociology course.

Prerequisite: Enrollment is restricted to junior and senior majors, proposed majors, and minors in sociology, global information and social enterprise, and Latin American studies/sociology combined majors.

SOCY 150 - Sociology of Death and Dying (5)

Explores contemporary, historical, cross-cultural and interdisciplinary perspectives on the social psychology of death and dying. Cultural norms and institutional contexts are studied, along with the individual experience, and the ways in which our perspectives on death and dying influence our experiences of life and living.

Prerequisite: Prerequisite(s): SOCY 1 or SOCY 10 or SOCY 15 Enrollment is restricted to sophomores, juniors, and seniors.

SOCY 152 - Body and Society (5)

Critically examines the place of the human body in contemporary society. Focuses on the social and cultural

construction of bodies, including how they are gendered, racialized, sexualized, politicized, represented, colonized, contained, controlled, and inscribed. Discusses relationship between embodiment, lived experiences, and social action. Focuses on body politics in Western society and culture, especially the United States.

Prerequisite: Enrollment is restricted to junior and senior majors and minors and proposed majors and minors in sociology, global information and enterprise, and Latin American studies/sociology combined.

SOCY 153 - Sociology of Emotions (5)

Examines sociological approaches to the understanding of emotions and the application of these approaches to work, learning, interpersonal relationships, health and illness, sports, and other aspects of everyday life.

Prerequisite: Enrollment is restricted to junior and senior majors, proposed majors, and minors in sociology, global information and social enterprise, and Latin American studies/sociology combined majors.

SOCY 155 - Political Consciousness (5)

Explores the relationship between consciousness, ideology, and political behaviors from voting to rebellion. Special attention is given to the lived experience and the identity interests that complicate the nexus of class position and political ideology. An introductory sociology course is recommended as preparation.

SOCY 156 - U.S. Latinx Identities: Centers and Margins (5)

Explores historical and contemporary constructions of Latinx identities and experiences in U.S. Particular emphasis placed on transcultural social contexts, racial formations, and intersections with other identities including sexuality and gender. (Formerly U.S. Latina/o Identities: Centers and Margins).

Prerequisite: Enrollment is restricted to junior and senior majors, proposed majors, and minors in sociology, global information and enterprise, Latin American studies, and Latin American studies/sociology combined.

SOCY 157 - Sexualities and Society (5)

Explores controversies in the sociology of sexuality. Focuses on tensions and disagreements that characterize debates over sex and society, and attempts to identify political and theoretical issues at stake in these debates.

Prerequisite: Enrollment is restricted to sophomore, junior and senior majors, proposed majors, and minors in sociology, feminist studies, global information and social enterprise, and Latin American studies/sociology combined.

SOCY 158 - Politics of Sex Work and Erotic Labor (5)

Examines sex work in an historical and cultural context, considering how it has changed over time. Considers the relationship of pornography, exotic dance, and selling sex on the Internet to racialization, queer politics, globalization, and

tourism. Employs theories and methods of cultural studies in rethinking historical debates on sex work.

Prerequisite: Prerequisite(s): SOCY 120 and SOCY 126. Enrollment is restricted to junior and senior majors, proposed majors, and minors in sociology, feminist studies, global information and social enterprise, and Latin American studies/sociology combined.

SOCY 163 - Global Corporations and National States (5)

Examines the nature and development of the capitalist world system since 1945. Emphasis is on the power of multinational corporations as managers of the world system and the response of states: role of multilateral agencies such as the World Bank, International Monetary Fund, United Nations.

Prerequisite: Prerequisite(s): SOCY 15. Enrollment is restricted to sophomore, junior, and senior majors, proposed majors, and minors in sociology, global information and social enterprise, and Latin American studies/sociology combined.

SOCY 164 - Capitalism and Its Critics (5)

Through comparative analysis of texts by several social theorists, explores the rise and consequences of capitalism. How has capitalism affected how humans understand and act in the world? How do oppressions along the lines of race, gender, sexuality, and nations intersect with capitalism? Is resistance desirable and/or possible?

Prerequisite: Enrollment is restricted to junior and senior sociology, global information and enterprise, and combined Latin American and Latin Studies/sociology majors, proposed majors, and minors, or by instructor permission.

SOCY 164T - Marx and Marxist Theory (5)

Along with studying Marx's anatomy of capitalist society, this course also explores the work of Marxist theorists from the early 20th century through the contemporary moment.

Prerequisite: Prerequisite(s): SOCY 105A or consent of instructor.

SOCY 166 - Economics for Non-Economists (5)

Fosters economic literacy among students who are not economics majors but are interested in the political and social ramifications of economic change. Emphasizes economic institutions and policy and is taught by case-study method, which requires active student participation.

Prerequisite: Enrollment is restricted to juniors and seniors.

SOCY 167 - Development and Underdevelopment (5)

Examines contemporary debates about development in the Third World: alternative meanings of development, recent work on the impact of colonial rule, how some economies have industrialized, ideas about agrarian change, and recent research on paths out of poverty. Students work in pairs to examine a development in one country since World War II. SOCY 15 recommended.

Prerequisite: Enrollment is restricted to sophomore, junior, and senior majors, proposed majors, and minors in sociology, anthropology, politics, global economics, global information and social enterprise, and Latin American studies/sociology combined majors.

SOCY 168 - Social Justice (5)

Explores sociological approaches to the quest for--and the realization of--social justice. Examines a range of approaches to such ongoing challenges as racism, sexism, gendered discrimination, classism, poverty, violence, militarism, environmental devastation, ableism, and ageism using non-fiction literature and biographical anthologies.

SOCY 169 - Social Inequality (5)

A survey of theories and systems of social stratification focusing on such phenomena as race, class, power, and prestige.

Prerequisite: Enrollment is restricted to junior and senior sociology and Latin American studies/sociology combined majors.

SOCY 170 - Ethnicity and Race (5)

Examines the enduring and changing status of ethnic and racialized minority groups in the United States, such as Latina/os, African Americans, Asian Americans, indigenous peoples within the U.S., as intersecting, historically situated, and dynamically produced categories of social identity and organization. (Formerly Ethnic and Status Groups.)

Prerequisite: Prerequisite(s): SOCY 1 or SOCY 10 or CRES 10.

SOCY 170P - The Political Economy of Race (5)

Explores the enduring racial and economic legacies of slavery and colonialism in relation to contemporary social problems, with an emphasis on segregation, policing, the prison industrial complex, immigration, and borders.

Prerequisite: Prerequisite(s): SOCY 1 or SOCY 10 or SOCY 15 or CRES 10, or by permission of the instructor.

SOCY 171 - Exploring Global Inequality (5)

Seminar focusing on readings of key texts and recent research papers on several dimensions of global inequality (material, health, gender, cultural, migration) to find innovative ways of understanding the connections among different dimensions of inequality and of visualizing inequality in digital media. Students prepare visual presentations on contemporary social inequalities suitable for an online (for example, <http://ucatlas.ucsc.edu/>) or print atlas.

Prerequisite: Enrollment is restricted to seniors.

SOCY 172 - Sociology of Social Movements (5)

Through readings on social movements that span the 20th century, course examines the causes of popular mobilizations, their potential for rapid social change, and the theories developed to understand and explain their role in modern social life.

Prerequisite: Enrollment is restricted to junior and senior majors, proposed majors, and minors in sociology, global information and social enterprise, and Latin American studies/sociology combined majors.

SOCY 173 - Water (5)

Analyzes access to clean water, both in the American West and global South. Reviews water quality, pivotal role of water in settlement and society, history and contemporary inequalities, water supplies, international conflict over water, climate change, and human use of water.

Prerequisite: Enrollment is restricted to junior and senior sociology majors, and proposed majors, and minors in sociology, environmental studies, global information and social enterprise, and Latin American studies/sociology combined.

SOCY 173X - Water and Sanitation Justice (5)

In the global North and South, inequalities in water and sanitation are issues of justice as much as income. One billion people worldwide lack safe water, 2.5 billion lack basic sanitation. Course explores: North-South comparison, water governance, human rights, poverty, climate justice, irrigation, and more.

SOCY 176 - Women and Work (5)

Examines the history of women and work; women's current conditions of work and political, economic, and social factors affecting these conditions; means by which women may shape working conditions including contributing leadership, developing policies, building unity, and creating alliances.

Prerequisite: Enrollment is restricted to junior and senior majors, proposed majors, and minors in sociology, feminist studies, global information and social enterprise, and Latin American studies/sociology combined.

SOCY 176A - Work and Inequality (5)

Addresses how work is organized and shapes life changes. Covers: the history of paid work; the impact of technology; race/class/gender at work; professional and service work; work and family; collective responses to work; and challenges of work in a globalizing economy.

Prerequisite: Enrollment is restricted to junior and senior majors, proposed majors, and minors in sociology, community studies, global information and social enterprise, and Latin American studies/sociology combined majors.

SOCY 177 - Urban Sociology (5)

Historical and contemporary examination of urban life including community, race, geography, urban and suburban cultures and lifestyles, stratification, housing, crime, economic and environmental issues, demographic changes, and global urbanization.

Prerequisite: Enrollment is restricted to junior and senior majors, proposed majors, and minors in sociology, global information and social enterprise, and Latin American studies/sociology combined.

SOCY 177A - Latinos/as and the American Global City (5)

Examines roles of emerging Latino/a majorities in urban centers across the U.S. Explores the Latinization of U.S. cities and various factors affecting the life chances of Latinos/as including, but not limited to, immigration, segregation, social movements, and other forms of political participation.

Prerequisite: Enrollment is restricted to junior and senior majors, proposed majors, and minors in sociology, Latin American and latino studies, global information and social enterprise, and Latin American studies/sociology combined.

SOCY 177E - Eco-Metropolis: Research Seminar in Urban and Environmental Studies (5)

Explores the intersection of cities and the environment through the emerging field of urban environmental studies. Focuses on varied and often contested efforts at urban sustainability in recent history. Draws on literatures in environmental history, environmental and urban sociology, geography, political ecology, and cultural studies.

Prerequisite: Enrollment is restricted to junior and senior majors, proposed majors, and minors in sociology, community studies, global information and social enterprise, and Latin American studies/sociology combined.

SOCY 177G - Global Cities (5)

Explores how global cities have facilitated increasing integration of the diverse cultures and economies of the world. Using historical, sociological, and comparative methods, analyzes how these spaces both enable and constrain transnational flows of capital, labor, information, and culture.

Prerequisite: Enrollment is restricted to junior and senior majors, proposed majors, and minors in sociology, community studies, global information and social enterprise, and Latin American studies/sociology combined.

SOCY 178 - Sociology of Social Problems (5)

Views problems in society not as given but as social constructs. Examines the ways in which conditions in society become identified and defined as problems and consequences that follow from such a process.

Prerequisite: Enrollment is restricted to junior and senior majors, proposed majors, and minors in sociology, global information and social enterprise, and Latin American studies/sociology combined.

SOCY 178T - Special Topics in Sociology (5)

Taught on a rolling basis by faculty members with each offering varying by instructor. Topics are announced by the department.

Prerequisite: Prerequisite(s): SOCY 1 or SOCY 10 or SOCY 15. Enrollment is restricted to sophomores, juniors, and seniors.

SOCY 178Z - Disability and Society (5)

An in-depth exploration of Disability Studies, an interdisciplinary field of research that seeks to question and critique dominant Western understandings of disability and to

advance discussions around issues of intersectionality, equality, inclusionary politics of access, and social justice.

SOCY 179 - Nature, Poverty, and Progress: Dilemmas of Development and Environment (5)

Concerns about environmental change, including global warming, threats to the ozone layer, and industrial pollution, raise questions about Third World development. Simple views of the relation between society and nature, such as blaming population growth, industrialization, or poor people, seem to preclude higher living standards. Uses debates and case studies to explore more subtle and optimistic views of social-natural relations.

Prerequisite: Enrollment is restricted to sophomore, junior, and senior majors, proposed majors, and minors in environmental studies, sociology, global information and social enterprise, and Latin American studies/sociology combined majors. SOCY 15 recommended.

SOCY 180 - Social Movements of the 1960s (5)

Examines the roots, development, and political outcomes of black civil rights organizations during the Sixties. Explores social and structural forces, mobilization of black communities, strategies and tactics used, nature of the relationships between various civil rights organizations, unity and disunity among organizations, leadership gains, and impact on race relations in the U.S.

Prerequisite: Enrollment is restricted to junior and senior majors, proposed majors, and minors in sociology, global information and social enterprise, and Latin American studies/sociology combined majors.

SOCY 184 - Hunger and Famine (5)

Why do famines happen? Why are some hungry and some over-fed? Recent advances in the understanding of food crises and chronic undernutrition are the focus of this course.

Prerequisite: Enrollment is restricted to junior and senior majors, proposed majors, and minors in sociology, global information and social enterprise, and Latin American studies/sociology combined.

SOCY 185 - Environmental Inequality (5)

Modern society not only assaults nature, it does so in ways that reproduce existing social inequalities. This course reviews three types of contemporary environmental inequality (environmental racism, displacement, and privilege), and the processes that produced them, with a focus on industrialization, urbanization, and the rise of capitalism in Europe and the United States.

Prerequisite: Enrollment is restricted to junior and senior majors, proposed majors, and minors in sociology, community studies, global information and social enterprise, environmental studies, and Latin American studies/sociology combined.

SOCY 187 - Feminist Theory (5)

Examination of shifts in 20th- and 21st-century feminist theory and epistemology. Considers various deconstructive challenges

to second wave feminism based on the politics of race, ethnicity, nation, sexuality, and class. Focus changes regularly.

Prerequisite: Prerequisite(s): SOCY 1 or FMST 1. Enrollment is restricted to sophomores, juniors, and seniors.

SOCY 188A - Social Change in the Global Economy (5)

Explores local dimensions of globalization, focusing on experiencing more global divisions of labor in both industrialized and developing countries. Themes include: economic integration and dislocation; new forms of governance; globalizing consumption and culture; gender; and popular resistance.

Prerequisite: Prerequisite(s): SOCY 15. Enrollment is restricted to junior and senior majors, proposed majors, and minors in sociology, global information and social enterprise, and Latin American studies/sociology combined majors.

SOCY 193 - Field Study (5)

Provides for (department-sponsored) individual field study in the vicinity of the campus under the direct supervision of a faculty sponsor (as opposed to SOCY 198 where faculty supervision is by correspondence). Up to three such courses may be taken for credit in any one quarter. Ordinarily call numbers for this course will not be issued after the first week of instruction. Students submit petition to sponsoring agency.

SOCY 193F - Field Study (2)

Provides for department-sponsored individual field study in the vicinity of campus under the direct supervision of a faculty sponsor. May not be counted toward major requirements. Students submit petition to sponsoring agency.

SOCY 194 - Group Tutorial (5)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Students submit petition to sponsoring agency.

SOCY 194F - Group Tutorial (2)

Small group study of a particular topic in consultation with a faculty sponsor. Students submit petition to sponsoring agency.

SOCY 195A - Senior Thesis (5)

Preparation of a senior thesis over one, two, or three quarters, beginning in any quarter. The senior thesis satisfies the comprehensive requirement. Course is for independent thesis research and writing. Courses may be taken consecutively or concurrently. Prerequisite(s): SOCY 103B. Students submit petition to sponsoring agency.

SOCY 195B - Senior Thesis (5)

Preparation of a senior thesis over one, two, or three quarters, beginning in any quarter. The senior thesis satisfies the comprehensive requirement. Course is for independent thesis research and writing. Courses may be taken consecutively or concurrently. Prerequisite(s): SOCY 103B. Students submit petition to sponsoring agency.

SOCY 195C - Senior Thesis (5)

Preparation of a senior thesis over one, two, or three quarters, beginning in any quarter. The senior thesis satisfies the comprehensive requirement. Course is for independent thesis research and writing. Courses may be taken consecutively or concurrently. Completion of course 195C (completion of the thesis) satisfies the W general education requirement. Prerequisite(s): SOCY 103B and satisfaction of the Entry Level Writing and Composition requirements. Students submit petition to sponsoring agency.

SOCY 196G - Project Practicum: Global Information and Social Enterprise (5)

Project practicum and evaluation are required for completion of major or minor in global information and social enterprise studies (GISES). Projects require approval in advance by the director of GISES. Completed projects must be uploaded electronically on the website or archive of the Everett Program.

Prerequisite: Prerequisite(s): SOCY 107B or SOCY 30C.

SOCY 196S - Senior Seminar (5)

Small seminars that focus on advanced topics in sociology. The pedagogical aims vary but these seminars often emphasize at least one of the following: close textual analysis, critical and analytical thinking, active learning, field research, advanced research methods, or advanced theory. Topics vary yearly; consult current course listings. Enrollment by application with selection based on appropriate background and by consent of instructor. Satisfies senior comprehensive requirement. Restricted to senior sociology majors.

SOCY 198 - Independent Field Study (5)

Provides for (department-sponsored) individual study program off campus for which faculty supervision is not in person (e.g., supervision is by correspondence). Up to three such courses may be taken for credit in any one quarter. Ordinarily call numbers for this course will not be issued after the first week of instruction. Students submit petition to sponsoring agency.

SOCY 199 - Tutorial (5)

Advanced directed reading and research. Petitions may be obtained from the Sociology Department Office. Students submit petition to sponsoring agency.

SOCY 199F - Tutorial (2)

Advanced directed readings and research. Petitions may be obtained from the Sociology Department Office. Students submit petition to sponsoring agency.

Graduate

SOCY 201 - The Making of Classical Theory (5)

Examines the establishment of theory in the discipline of sociology. Introduces students to close readings and analysis of a core selection of social theory. Problematicizes the construction, maintenance, and reproduction of a theoretical canon in sociology.

Prerequisite: Enrollment is restricted to sociology graduate students and by permission number.

SOCY 202 - Contemporary Sociological Theory (5)

Intensive survey of major tendencies in modern social thought, including functionalism, symbolic interactionism, ethnomethodology, critical theory, structuralism, phenomenology, neo-Marxism, and feminist theory.

Prerequisite: Enrollment is restricted to sociology graduate students and by permission number.

SOCY 203 - Sociological Methods (5)

Approaches methods as a series of conscious and strategic choices for doing various kinds of research. Introduces students to the epistemological questions of method in social sciences; to key issues in technique, particularly control, reliability, and validity; and to good examples of social research.

Prerequisite: Enrollment is restricted to sociology graduate students and by permission number.

SOCY 204 - Methods of Quantitative Analysis (5)

Students are provided with intuitive explanation of fundamental concepts in statistics and learn how to use statistics to answer sociological questions. Experience and guidance in using computers to efficiently analyze data are provided.

Prerequisite: Enrollment is restricted to sociology graduate students and by permission number.

SOCY 205 - Field Research Methods (5)

Gives students first-hand experience doing fieldwork with an emphasis on participant observation and some interviewing. Students submit weekly field notes and a final project analysis. At seminar meetings, field experiences and relevant literature are examined.

Prerequisite: Enrollment is restricted to sociology graduate students and by permission number.

SOCY 206 - Comparative Historical Methods (5)

Overview of research strategies and methods used in historical and social sciences. Students read works exemplifying a variety of analytical approaches. Written assignments cultivate critical skills, weighing of tradeoffs inherent in all methodological choices, and elaboration of hypothetical research designs.

Prerequisite: Enrollment is restricted to graduate students.

SOCY 208 - Writing Practicum (5)

Writing intensive course designed to facilitate the completion of the master's thesis, orals field statement, or the dissertation in sociology. The seminar is convened by a faculty member in conjunction with students and their adviser or appropriate committee chair. Students are expected to produce and present drafts of work completed in the seminar.

Prerequisite: Enrollment is restricted to sociology graduate students and by permission number.

SOCY 209 - The Analysis of Cultural Forms (5)

Examines material and symbolic forms such as media products, cultural artifacts, language, nonverbal communication and social practices using discourse, textual, content, interpretive, and conversation analyses as well as ethnography and different channels of communication. Theoretically, relies on cultural studies, communication studies, cultural sociology, film studies, and ethnomethodology.

Prerequisite: Enrollment is restricted to sociology graduate students.

SOCY 220 - Global Transformation: Macrosociological Perspectives (5)

Classical concepts and contemporary approaches in macrosociology, the study of large-scale, long term social change. Readings drawn primarily from the Marxian and Weberian traditions (new institutionalism, varieties of neo-Marxism, environmental history, state centrism) as they focus on agrarian and industrial structures and commodity chains; household, village, and neighborhood organization; social movements and revolutions; culture, ideology, and consciousness; policy analysis; comparative urban, national, and civilizational development.

Prerequisite: Enrollment is restricted to sociology graduate students.

SOCY 222 - Political Sociology (5)

A survey of major works and themes in the relationship of politics and society, with primary emphasis on the compatibilities and contradictions of pluralist, elite, and class perspectives on the state.

Prerequisite: Enrollment is restricted to graduate students.

SOCY 223 - Sociology of the Environment (5)

Advanced treatment of the dominant ideas of nature and the environment in the West and their relationship to the development of Western capitalism. Leading Western theories of environmental crisis and their relation with ideologies of environmentalism and environmental movements.

Prerequisite: Enrollment is restricted to graduate students.

SOCY 224 - Globalization: Theories and Social Movements (5)

Examines the structures, processes, and movements associated with globalization processes. Reviews political economy theories, cultural theories systems, state industrial policies, and popular responses to globalization. Also assesses contribution of resistance movements informed by class, ethno-nationalism, religion, or gender.

Prerequisite: Enrollment is restricted to graduate students.

SOCY 225 - Political Economy for Sociologists (5)

Examines rudiments of historical materialism in light of advances in cultural and ecological Marxism. Basic categories of Marxist political economy. Thematic focus on the first and second contradictions of capitalism in world economy today.

Prerequisite: Enrollment is restricted to graduate students.

SOCY 227 - Learning from Environmental Historians (5)

Looks at several major themes in the sociology of the environment and asks how the works of environmental history address those themes. Includes reflections on how history as a method interrogates social questions. Possible themes include: sustainability; social justice; universalism vs. particularity; city and country; and social movements.

Prerequisite: Enrollment is restricted to graduate students.

SOCY 229 - Work and Labor Markets in the New Economy (5)

Focuses on the interaction of work restructuring and existing race/class/gender inequalities. Themes include: the labor process and theories of consent; labor market segmentation; job and occupational segregation; information technologies, flexible work, and post-industrialism; flexible employment relations; and low-wage service and labor markets.

Prerequisite: Enrollment is restricted to graduate students.

SOCY 230 - Theory and Method in the Sociology of Marx (5)

Examines theoretical and methodological implications of Marxist theory for empirical social research. Analyzes how historians and social scientists apply Marxist method in explaining society, social change, globalization, culture, and late capitalism. Goal is to assist students to employ Marxist theory and method creatively in their research projects.

Prerequisite: Enrollment is restricted to graduate students.

SOCY 240 - Inequality and Identity (5)

Explores recent theoretical and empirical studies of race, class, gender, and sexuality with an emphasis on the production of identities and their relationship to processes and structures of power in a postcolonial context.

Prerequisite: Enrollment is restricted to sociology graduate students.

SOCY 241 - Cross-National and Cross-Cultural Research (5)

Seminar examining theoretical and methodological issues in doing cross-national and cross-cultural research. In addition to a consideration of different research paradigms and approaches, representative works from each comparative tradition are examined.

Prerequisite: Enrollment is restricted to graduate students.

SOCY 242 - Feminist Research Seminar (5)

Provides scholarly support to students doing feminist research. Examines issues concerning conceptualization of feminism and feminist research. Explores relation of feminist research to intersections of gender, class, and race; to the self; to power; and to transformative social praxis. Students present and are given assistance with their work, as well as listen to, read, and assist with the work of others.

Prerequisite: Enrollment is restricted to graduate students.

SOCY 244 - Race and Ethnicity (5)

A critical survey of the theoretical issues of persistence and change, public policy, and recent empirical studies in the field of race and ethnic relations. Readings introduce comparative race relations and a historical background of major theoretical paradigms in the field which purport to explain race and ethnic relations in general and race relations in America specifically.

Prerequisite: Enrollment is restricted to graduate students.

SOCY 245 - Feminist Theory (5)

Examination of shifts in 20th- and 21st-century feminist theory and epistemology. Explores the decentering of universalist feminist theories and asks what constitutes feminist theory after gender has been decentered. Considers various deconstructive challenges to second-wave feminist theory based on the politics of race, ethnicity, nation, sexuality, and class. Focus changes regularly.

Prerequisite: Enrollment is restricted to sociology graduate students.

SOCY 246 - Class, Culture, and Movement (5)

Analyzes impact of ethnicity, gender, and religion on the class situation of laboring people in a globalized economy by intensive reading and critique of classic studies, explaining how social movements reflect combinations of social relations and cultural practices.

Prerequisite: Enrollment is restricted to graduate students.

SOCY 247 - Race and Class (5)

Introduces the student to the recent literature on race and class. Covers several different theoretical perspectives including internal colonialism, labor market segmentation theories, racial formation, and neo-gramscian cultural analyses. In addition to study of theory, also compares theoretical perspectives to the historical experience of minority groups, in particular, blacks, Hispanics, and Asians.

Prerequisite: Enrollment is restricted to sociology graduate students.

SOCY 249 - Feminisms and Cultural Politics (5)

Focuses on the role feminist discourses play in contemporary cultural politics with the main focus on the politics of sex, sexuality, and sex work. Begins with considerations of (mis)representations of feminisms in popular cultures; considers the relationship between academic and popular feminisms; and interrogates the meaning of terms *post-feminism* and *third-wave feminism*.

Prerequisite: Enrollment is restricted to graduate students.

SOCY 250 - Course Design and Grant-Writing Seminar (5)

A professional training seminar devoted to the philosophical, conceptual, and practical issues of course design, pedagogy, and grant writing. Topics covered: institutional contexts; curriculum (including syllabi, course content, assignments, evaluation);

pedagogy; teaching as work/labor process; grant writing; budgets.

Prerequisite: Enrollment is restricted to sociology graduate students.

SOCY 252 - Symbolic Interactionism and Sociology of Emotions (5)

Examines classic and contemporary theories and concepts that play a major role in sociological studies of identity, symbolic and social interaction, and the sociology of emotions. Examines how cultural forms, rules, and rituals define, structure, and mediate emotions and how identities are situated within social institutions.

Prerequisite: Enrollment is restricted to graduate students.

SOCY 253 - Race, Crime, and Justice (5)

Covers empirical research on "race, crime, and justice" from multiple methodological and theoretical traditions in social science research. The course draws on historical examples of slavery, state violence, and crimes against humanity across the globe. Also covers research on the entanglement of race and crime in the United States, both historically and today.

Prerequisite: Enrollment is restricted graduate students.

SOCY 255 - Engaging Cultural Studies (5)

Examines feminist and ethnic studies production, appropriation, and transformation of cultural studies theories and methodologies. Considers the utility of various theoretical apparatuses and methodological strategies employed in the interdisciplinary site that combines feminist, ethnic, and cultural studies.

Prerequisite: Enrollment is restricted to graduate students.

SOCY 256 - Urban Sociology (5)

Introduction to core writings and key theoretical paradigms in urban sociology. Examines the history and contemporary conditions of cities in the U.S. and the urban experience. Urbanization, suburbanization, community, social inequality, urban politics, relationship between the built environment and human behavior.

Prerequisite: Enrollment is restricted to graduate students.

SOCY 257 - Colonialism, International Law, and Global Justice (5)

Examines colonialism, war crimes, crimes against humanity, and legal remedies, and the role of the International Criminal Court (ICC); traces the history of colonial expansionism, starting from the Roman Empire to the present American imperial dominance in global politics.

Prerequisite: Enrollment is restricted to graduate students.

SOCY 258 - Global Lay Justice Systems and Direct Democracy (5)

Introduces historical analysis of lay justice participation. Examines global exploration of the use of lay judge institutions

in citizen's movements and the assumption that juries are a derivative institution of democratic ideals. Focuses on corporate media creation of anti-jury sentiment.

Prerequisite: Enrollment is restricted to graduate students.

SOCY 259 - Space and the Politics of Difference (5)

Brings together the fields of sociology and geography to explore the complex and multiple ways of thinking together space and social difference. Course texts examine the co-constitution of space with bodies, subjectivities, and social formations.

Prerequisite: Enrollment is restricted to graduate students.

SOCY 260 - Culture, Knowledge, Power (5)

An introduction to theoretical approaches and exemplary studies of culture, knowledge, and power which critically interrogate the relationship between cultural formations and the production, circulation, and meaning of knowledges, materials, artifacts, and symbolic forms. Explores the concrete ways that power is organized and operates through different forms and sites, how it interpolates with other forms of power, and examines knowledges and culture as specific forms of power and sites of political struggle.

Prerequisite: Enrollment is restricted to sociology graduate students.

SOCY 261 - Sociology of Knowledge (5)

Explores three main issues: the social determination of knowledge, including natural science; the character of intellectual labor and intellectuals as a social group; the role of organized knowledge and knowledge industries in contemporary social change. Texts examined include class-based theories (Lukacs, Mannheim, Gramsci), feminist standpoint analysis (Smith, Harding, etc.), and theories of postmodern culture (Lyotard, Harvey, etc.).

Prerequisite: Enrollment is restricted to graduate students.

SOCY 262 - Cultural Practice and Everyday Life (5)

Examines contemporary debates about the role of mass produced expressive symbols in modern industrial societies, and the circumstances of cultural production for its impact on the creation, organization, and use of cultural artifacts. Concern with the use and experience of popular symbols for the ways that their use involves the creation of meanings and the role of such meanings in the social organization of society.

Prerequisite: Enrollment is restricted to graduate students.

SOCY 263 - Cultural Politics of Difference (5)

Considers the cultural turn and the turn to difference in understanding relations of power and struggles over representation in studies of race, media, and culture. Examines national identity, difference, subjectivity, and authenticity, especially as they bear on quests to create new identifications, alignments, and efforts to protect existing identities.

Prerequisite: Enrollment is restricted to graduate students.

SOCY 264 - Science, Technology, and Medicine (5)

Explores social and cultural perspectives on science, technology, and medicine. Analyzes theoretical approaches that open up black boxes of scientific and biomedical knowledge, including the politics of bodies, objects, and health/illness. Links are made to medical sociology.

Prerequisite: Enrollment is restricted to graduate students.

SOCY 268A - Science and Justice: Experiments in Collaboration (5)

Considers the practical and epistemological necessity of collaborative research in the development of new sciences and technologies that are attentive to questions of ethics and justice. Enrollment is by permission of instructor. Enrollment is restricted to graduate students.

SOCY 268B - Science and Justice Research Seminar (5)

Provides in-depth instruction in conducting collaborative interdisciplinary research. Students produce a final research project that explores how this training might generate research that is more responsive to the links between questions of knowledge and questions of justice. Prerequisite(s): SOCY 268A, BME 268A, FMST 268A, or ANTH 267A. Enrollment is restricted to graduate students and by permission of the instructor.

SOCY 282 - Social Policy Research (5)

Policy research. Covers a variety of theoretical perspectives found in policy studies. Surveys various methodological approaches used in policy research. Theories and methods linked to research agendas on the various phases of the policy life cycle. Students are required to design a research proposal.

Prerequisite: Enrollment is restricted to graduate students.

SOCY 290 - Advanced Topics in Sociological Analysis (5)

The topics to be analyzed each year vary with the instructor but focus upon a specific research area. Enrollment restricted to graduate students by consent of the instructor.

SOCY 293 - Going on the Job Market (5)

A seminar devoted to the practical problems of securing a job as a professional sociologist. Topics covered: researching colleges, universities, and public and private organizations that employ sociologists; designing a curriculum vitae; writing an application letter; preparing a job talk; handling questions during the interview process; the etiquette of visiting (and its aftermath); finding out about them; and the terms of employment: what is negotiable and what is not.

Prerequisite: Enrollment is restricted to graduate students.

SOCY 294 - Writing for Social Scientists (5)

Seminar on the genres of social science writing, and the problems of starting and finishing a publishable thesis, book, or article. For advanced graduate students working on the composition of their dissertations and journal articles.

Prerequisite: Enrollment is restricted to graduate students.

SOCY 297 - Independent Study (5)

Students submit petition to sponsoring agency.

SOCY 299 - Thesis Research (5)

Students submit petition to sponsoring agency.

SPAN - SPANISH**Lower-Division****SPAN 1 - First-Year Spanish (5)**

The first-year program is aimed at developing proficiency in Spanish. Listening, speaking, reading, and writing are addressed through classroom practice and supplemented by language laboratory work. Classes are taught entirely in Spanish and are held three days a week.

Prerequisite: Prerequisite(s): Placement into Spanish 1 via the online Spanish Placement Examination.

SPAN 2 - First-Year Spanish (5)

The first-year program is aimed at developing proficiency in Spanish. Listening, speaking, reading, and writing are addressed through classroom practice and supplemented by language laboratory work. Classes are taught entirely in Spanish and are held three days a week.

Prerequisite: Prerequisite(s): SPAN 1 or placement into Spanish 2 via the online Spanish Placement Examination.

SPAN 3 - First-Year Spanish (5)

The first-year program is aimed at developing proficiency in Spanish. Listening, speaking, reading, and writing are addressed through classroom practice and supplemented by language laboratory work. Classes are taught entirely in Spanish and are held three days a week.

Prerequisite: Prerequisite(s): SPAN 2 or placement into SPAN 3 via the online Spanish Placement Examination.

SPAN 4 - Second-Year Spanish (5)

Includes comprehensive grammar review, composition, readings, and discussion. Reading and audiovisual material deal with various sociopolitical and cultural issues in the Spanish-speaking world. Classes are conducted in Spanish.

Prerequisite: Prerequisite(s): SPAN 1B or SPAN 3 or placement into SPAN 4 via the online Spanish Placement Examination.

SPAN 5 - Second-Year Spanish (5)

Includes comprehensive grammar review, composition, readings, and discussion. Reading and audiovisual material deal with various socio-political and cultural issues in the Spanish-speaking world. Classes are conducted in Spanish.

Prerequisite: Prerequisite(s): SPAN 4 or placement into SPAN 5 via the online Spanish Placement Examination.

SPAN 5M - Medical Spanish (5)

Students learn medical vocabulary, useful expressions, suitable grammatical structures, and cultural background to be able to interact with Spanish-speaking patients and doctors. Medical Spanish fulfills language requirement for Human Biology majors.

Prerequisite: Prerequisite(s): SPAN 4; or SPHS 4, or SPHS 5, or SPHS 6; or placement into SPAN 5 or SPHS 4 via the online Spanish Placement Examination. Enrollment is restricted to human biology majors.

SPAN 6 - Second-Year Spanish (5)

Increases oral and written proficiency using authentic reading materials which focus on such topics as social class, ethnicity, education, religion, economic, and political developments in the Spanish-speaking world.

Prerequisite: Prerequisite(s): SPAN 5 or SPAN 5M or placement into SPAN 6 via the online Spanish Placement Examination.

SPAN 94 - Group Tutorial (5)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Students submit petition to sponsoring agency.

SPAN 99 - Tutorial (5)

Students submit petition to sponsoring agency.

SPAN 99F - Tutorial (2)

Students submit petition to sponsoring agency.

Upper-Division**SPAN 114 - Advanced Conversation and Composition (5)**

Advanced conversation and composition based on extensive readings in the humanities and social sciences. Students interested in this course who have not taken the prerequisite should meet with the instructor prior to the first class meeting.

Prerequisite: Prerequisite(s): satisfaction of Entry Level Writing and Composition requirements; SPAN 6, or SPHS 6, or by instructor consent.

SPAN 140 - Sounds of Spanish (5)

Examines the sound system of Spanish, compares the English and Spanish systems of pronunciation, and teaches the phonetic/phonological variation across dialects of Spanish.

Prerequisite: Prerequisite(s): SPAN 6 or SPHS 6; and LING 50.

SPAN 141 - Advanced Spanish Grammar (5)

This practical course builds upon students' existing knowledge of Spanish grammar. Introducing linguistic framework, some analysis tools, and intensive practice, it aims at fostering students' reflection about Spanish grammar, consolidating their knowledge of the system of rules underlying it, and improving their grammatical accuracy.

Prerequisite: Prerequisite(s): SPAN 6 or SPHS 6 or equivalent proficiency.

SPAN 150 - Topics in Hispanic Linguistics: Introduction to Hispanic Linguistics (5)

Taught in Spanish. Students learn the major properties of the Spanish language from a linguistics perspective. Topics covered include: phonetics/phonology, morphology, and syntax.

Prerequisite: Prerequisite(s): LING 50; and SPAN 6 or SPHS 6 or equivalent Spanish proficiency.

SPAN 151 - Topics in Hispanic Linguistics: Varieties of Spanish (5)

Taught in Spanish. Explores the linguistic variety of the Spanish language in the Iberian Peninsula, the former Spanish colonies, and the Americas from a descriptive, synchronic perspective. Issues of languages in contact, variation in speech communities, and bilingualism are also introduced.

Prerequisite: Prerequisite(s): SPAN 150. Enrollment is restricted to senior Spanish studies majors.

SPAN 152 - Topics in Hispanic Linguistics: Spanish in the U.S. (5)

Taught in Spanish. Serves as a linguistic introduction to the varieties of Spanish that are currently spoken in the United States. Some central topics include: code-switching, language maintenance, and language contact phenomena.

Prerequisite: Prerequisite(s): SPAN 150. Enrollment is restricted to senior Spanish studies majors.

SPAN 153 - Topics in Hispanic Linguistics: Spanish as a Second Language (5)

Taught in Spanish. Examines the Spanish language as it is acquired and used by non-native speakers. Provides an overview of language-teaching methodologies and in-depth treatment of areas of Spanish grammar/lexicon that are generally problematic for English-speaking learners.

Prerequisite: Prerequisite(s): SPAN 150. Enrollment is restricted to senior Spanish studies majors.

SPAN 154 - Topics in Hispanic Linguistics: Spanish Pragmatics (5)

Explores how Spanish is used in context by speakers to achieve particular meanings and to realize various speech acts (e.g., requests, apologies, etc.) in socially appropriate ways. Pragmatic variation across the Spanish-speaking world is examined in depth.

Prerequisite: Prerequisite(s): SPAN 6 or SPHS 6; and SPAN 150. Enrollment is restricted to juniors and seniors majoring in Spanish studies, language studies or linguistics.

SPAN 156A - The Language of Latin America Cinema (5)

Explores Latin American culture through its cinematic art. Students are exposed to and participate in discussion, analysis, and commentary on important social, historical, and political

issues presented in the films. Provides a greater understanding of Latin America, and works toward advanced communicative proficiency and comprehension of linguistic variations in countries such as Cuba, Argentina, México, Bolivia, Chile, and others.

Prerequisite: Prerequisite(s): SPAN 6 or SPHS 6 or placement into SPAN 156A via the online Spanish Placement Examination.

SPAN 156E - Spanish Culture (5)

A broad survey of Spanish cultural topics, including history, politics, religions, art forms, music, and films. It is based on extensive conversations, discussion, and composition. Particular emphasis is placed on key changes that have occurred during the 20th century in Spain. Classes conducted through commentary on texts read (or viewed), oral presentations, and debate. Recommended for students preparing to go to Spain with EAP.

Prerequisite: Prerequisite(s): SPAN 6 or SPHS 6 or placement into SPAN 156E via the online Spanish Placement Examination.

SPAN 156F - El Humor en Espanol (5)

Topic-oriented language course on sociopolitical and historical issues as seen through humor in different genres and media. Topics include Mafalda and Condorito (comic strips), Rius (collage of comic strips, photographs and original documents), Continflas and Almodovar (cinema), El Teatro Campesino (theater), Ana L., Vega (literature), Les Luthiers (song and music). Course deals with written and oral discourse pertaining to the following Spanish language varieties: Rio de la Plata, Mexican, Caribbean, U.S., and Peninsular. Intensive writing and speaking in Spanish.

Prerequisite: Prerequisite(s): SPAN 6 or SPHS 6 or placement into SPAN 156F via the online Spanish Placement Examination.

SPAN 156J - Contemporary Central America (5)

Introduces Central American cultures, including an overview of historical, political, and socioeconomic development, and cultural products, such as literature, film, and visual arts. Emphasis placed on the forces that shaped contemporary Central America, cultural and ethnic diversity, identity, revolutionary processes, diaspora, and building democracy in post-civil conflict societies. Draws attention to the linguistic features of Central American variations of Spanish. The class is conducted in Spanish with high expectations to enhance oral and written proficiency through writing assignments, research tasks, group presentations, analysis, discussion, and debate.

Prerequisite: Prerequisite(s): SPAN 6 or SPHS 6 or placement into Spanish 156J via the online Spanish Placement Examination.

SPAN 156K - Spanish Discourse Analysis (5)

Focuses on the main linguistic approaches that have discourse (i.e. pieces of talk larger than a sentence) as their main object of study. Reviews the theoretical foundations of each approach

and the main tools used, with special attention to those studies developed about Spanish in all its varieties.

Prerequisite: Prerequisite(s): SPAN 6 or SPHS 6, and LING 50.

SPAN 156M - Mexico and the Southwest (5)

An interdisciplinary survey of the cultural history of the Mexican people in both Mexico and the U.S. Southwest. Topics include literature, art, folklore, oral tradition, music, politics, as well as everyday cultural manifestations. Conducted in Spanish. May be counted toward fulfillment of upper-division major requirements for Latin American and Latino studies and language studies.

Prerequisite: Prerequisite(s): SPAN 6 or SPHS 6 or equivalent Spanish proficiency.

SPAN 194 - Group Tutorial (5)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Students submit petition to sponsoring agency.

SPAN 199 - Tutorial (5)

Students submit petition to sponsoring agency.

SPAN 199F - Tutorial (2)

Students submit petition to sponsoring agency.

SPHS - SPANISH FOR HERITAGE SPEAKERS

Lower-Division

SPHS 4 - Spanish for Heritage Speakers (5)

Deals with orthography, lexicon development, morphology, syntax, and other linguistic topics as applied to the development of all language skills (listening, reading, speaking, and writing). Emphasizes reading and writing about well-known and pivotal authentic texts of varying genres and formats from the Spanish-speaking world. Emphasis is on the United States, Mexico, and Spain. Students need to use the self-placement questionnaire posted on the Language Program web page.

Prerequisite: Prerequisite(s): Placement into SPHS 4 via the online Spanish Placement Examination.

SPHS 5 - Spanish for Heritage Speakers (5)

Deals with orthography, lexicon development, morphology, syntax, and other linguistic topics as applied to the development of all language skills (listening, reading, speaking, and writing). Emphasizes reading and writing about well-known and pivotal authentic texts of varying genres and formats from the Spanish-speaking world. Emphasis is on Central America and the Caribbean.

Prerequisite: Prerequisite(s): SPHS 4 or by consent of program coordinator.

SPHS 6 - Spanish for Heritage Speakers (5)

Deals with orthography, lexicon development, morphology, syntax, and other linguistic topics as applied to the development of all language skills (listening, reading, speaking, and writing). Emphasizes reading and writing about well-known and pivotal authentic texts of varying genres and formats from the Spanish-speaking world. Emphasis is on South America.

Prerequisite: Prerequisite(s): SPHS 5.

SPHS 94 - Group Tutorial (5)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Students submit petition to sponsoring agency.

SPHS 99 - Tutorial (5)

Students submit petition to sponsoring agency.

SPHS 99F - Tutorial (2)

Students submit petition to sponsoring agency.

Upper-Division**SPHS 115 - El ensayo lectura, analisis y redaccion (5)**

Centers on three areas: essay reading, essay analysis and interpretation, and essay writing. Student read representative essays by Latin American writers, analyze their discourse structure, and apply the lessons learned to their own writing.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; SPAN 6 or SPHS 6. Enrollment restricted to sophomore, junior, and senior Spanish studies majors.

SPHS 194 - Group Tutorial (5)

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor.

SPHS 199 - Tutorial (5)

Students submit petition to sponsoring agency.

SPHS 199F - Tutorial (2)

Students submit petition to sponsoring agency.

STAT - STATISTICS**Lower-Division****STAT 5 - Statistics (5)**

Introduction to statistical methods/reasoning, including descriptive methods, data-gathering (experimental design and sample surveys), probability, interval estimation, significance tests, one- and two-sample problems, categorical data analysis, correlation and regression. Emphasis on applications to the natural and social sciences. Students cannot receive credit for this course if they have already received credit for STAT 7. (Formerly AMS 5.)

STAT 7 - Statistical Methods for the Biological, Environmental, and Health Sciences (5)

Case-study-based introduction to statistical methods as practiced in the biological, environmental, and health sciences. Descriptive methods, experimental design, probability, interval estimation, hypothesis testing, one- and two-sample problems, power and sample size calculations, simple correlation and simple linear regression, one-way analysis of variance, categorical data analysis. (Formerly AMS 7.)

Prerequisite: Prerequisite(s): score of 300 or higher on the mathematics placement examination (MPE), or AM 3 or AM 6 or AM 11A or AM 15A or MATH 3 or MATH 11A or MATH 19A. Concurrent enrollment in STAT 7L is required.

STAT 7L - Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory (2)

Computer-based laboratory course in which students gain hands-on experience in analysis of data sets arising from statistical problem-solving in the biological, environmental, and health sciences. Descriptive methods, interval estimation, hypothesis testing, one- and two-sample problems, correlation and regression, one-way analysis of variance, categorical data analysis. (Formerly AMS 7L.)

Prerequisite: Prerequisite(s): score of 300 or higher on the mathematics placement examination (MPE), AM 3 or AM 6 or AM 11A or AM 15A or MATH 3 or MATH 11A or MATH 19A. Concurrent enrollment in STAT 7 is required.

STAT 80A - Gambling and Gaming (5)

Games of chance and strategy motivated early developments in probability, statistics, and decision theory. Course uses popular games to introduce students to these concepts, which underpin recent scientific developments in economics, genetics, ecology, and physics. (Formerly AMS 80A.)

STAT 80B - Data Visualization (5)

Introduces the use of complex-data graphical representations to extract information from data. Topics include: summary statistics, boxplots, histograms, dotplots, scatterplots, bubble plots, and map-creation, as well as visualization of trees and hierarchies, networks and graphs, and text. (Formerly AMS 80B.)

Upper-Division**STAT 108 - Linear Regression (5)**

Covers simple linear regression, multiple regression, and analysis of variance models. Students learn to use the software package R to perform the analysis, and to construct a clear technical report on their analysis, readable by either scientists or nontechnical audiences. (Formerly AMS 156.)

Prerequisite: Prerequisite(s): STAT 132 and satisfaction of the Entry Level Writing and Composition requirements.

STAT 131 - Introduction to Probability Theory (5)

Introduction to probability theory and its applications. Combinatorial analysis, axioms of probability and independence, random variables (discrete and continuous), joint probability distributions, properties of expectation, Central Limit Theorem, Law of Large Numbers, Markov chains. Students cannot receive credit for this course and STAT 203 and CMPE 107. (Formerly AMS 131.)

Prerequisite: Prerequisite(s): AM 11B or ECON 11B or MATH 11B or MATH 19B or MATH 20B.

STAT 132 - Classical and Bayesian Inference (5)

Introduction to statistical inference at a calculus-based level: maximum likelihood estimation, sufficient statistics, distributions of estimators, confidence intervals, hypothesis testing, and Bayesian inference. (Formerly AMS 132.)

Prerequisite: Prerequisite(s): STAT 131 or CSE 107.

STAT 198 - Independent Study or Research (5)

Students submit petition to sponsoring agency.

STAT 198F - Independent Study or Research (2)

Students submit petition to sponsoring agency.

Graduate**STAT 200 - Research and Teaching in Statistics (3)**

Focuses on basic teaching techniques for teaching assistants, including responsibilities and rights, leading discussion or lab sessions, presentation techniques, maintaining class records, and grading. Examines research and professional training, including use of library, technical writing, giving seminar and conference talks, and ethical issues in science and engineering.

Prerequisite: Enrollment is restricted to graduate students.

STAT 202 - Linear Models in SAS (5)

Case study-based course teaches statistical linear modeling using the SAS software package. Teaches generalized linear models; linear regression; analysis of variance/covariance; analysis of data with random effects and repeated measures. (Formerly AMS 202.)

Prerequisite: Prerequisite(s): STAT 108 or STAT 208, or permission of instructor. Enrollment is restricted to graduate students.

STAT 203 - Introduction to Probability Theory (5)

Introduces probability theory and its applications. Requires a multivariate calculus background, but has no measure theoretic content. Topics include: combinatorial analysis; axioms of probability; random variables (discrete and continuous); joint probability distributions; expectation and higher moments; central limit theorem; law of large numbers; and Markov chains. Students cannot receive credit for this course and STAT 131 or CMPE 107. (Formerly AMS 203.)

Prerequisite: Enrollment is restricted to graduate students, or by permission of the instructor.

STAT 204 - Introduction to Statistical Data Analysis (5)

Presents tools for exploratory data analysis (EDA) and statistical modeling in R. Topics include numerical and graphical tools for EDA, linear and logistic regression, ANOVA, PCA, and tools for acquiring and storing large data. No R knowledge is required. Enrollment is restricted to graduate students and by permission of instructor. (Formerly AMS 204.)

Prerequisite: Enrollment restricted to graduate students.

STAT 205 - Introduction to Classical Statistical Learning (5)

Introduction to classical statistical inference. Topic include: random variables and distributions; types of convergence; central limit theorems; maximum likelihood estimation; Newton-Raphson, Fisher scoring, Expectation-Maximization, and stochastic gradient algorithms; confidence intervals; hypothesis testing; ridge regression, lasso, and elastic net.

Prerequisite: Prerequisite(s): STAT 203. Enrollment is restricted to graduate students.

STAT 205B - Intermediate Classical Inference (5)

Statistical inference from a frequentist point of view. Properties of random samples; convergence concepts applied to point estimators; principles of statistical inference; obtaining and evaluating point estimators with particular attention to maximum likelihood estimates and their properties; obtaining and evaluating interval estimators; and hypothesis testing methods and their properties. (Formerly AMS 205B.)

Prerequisite: Prerequisite(s): STAT 203 or equivalent. Enrollment is restricted to graduate students.

STAT 206 - Applied Bayesian Statistics (5)

Introduces Bayesian statistical modeling from a practitioner's perspective. Covers basic concepts (e.g., prior-posterior updating, Bayes factors, conjugacy, hierarchical modeling, shrinkage, etc.), computational tools (Markov chain Monte Carlo, Laplace approximations), and Bayesian inference for some specific models widely used in the literature (linear and generalized linear mixed models). (Formerly AMS 206.)

Prerequisite: Prerequisite(s): STAT 131 or STAT 203, or by permission of the instructor. Enrollment is restricted to graduate students.

STAT 206B - Intermediate Bayesian Inference (5)

Bayesian statistical methods for inference and prediction including: estimation; model selection and prediction; exchangeability; prior, likelihood, posterior, and predictive distributions; coherence and calibration; conjugate analysis; Markov Chain Monte Carlo methods for simulation-based computation; hierarchical modeling; Bayesian model diagnostics, model selection, and sensitivity analysis. (Formerly AMS 206B.)

Prerequisite: Prerequisite(s): STAT 203. Enrollment is restricted to graduate students; undergraduates may enroll by permission of the instructor.

STAT 207 - Intermediate Bayesian Statistical Modeling (5)

Hierarchical modeling, linear models (regression and analysis of variance) from the Bayesian point of view, intermediate Markov chain Monte Carlo methods, generalized linear models, multivariate models, mixture models, hidden Markov models. (Formerly AMS 207.)

Prerequisite: Prerequisite(s): STAT 206 or STAT 206B; enrollment is restricted to graduate students or by permission of instructor.

STAT 208 - Linear Statistical Models (5)

Theory, methods, and applications of linear statistical models. Review of simple correlation and simple linear regression. Multiple and partial correlation and multiple linear regression. Analysis of variance and covariance. Linear model diagnostics and model selection. Case studies drawn from natural, social, and medical sciences. STAT 205 strongly recommended as a prerequisite. Undergraduates are encouraged to take this class with permission of instructor. (Formerly AMS 256.)

Prerequisite: Prerequisite(s): course STAT 205B or permission of instructor. Enrollment is restricted to graduate students.

STAT 209 - Generalized Linear Models (5)

Theory, methods, and applications of generalized linear statistical models; review of linear models; binomial models for binary responses (including logistical regression and probit models); log-linear models for categorical data analysis; and Poisson models for count data. Case studies drawn from social, engineering, and life sciences. (Formerly AMS 274.)

Prerequisite: Prerequisite(s): STAT 205B or STAT 208. Enrollment is restricted to graduate students.

STAT 222 - Bayesian Nonparametric Methods (5)

Theory, methods, and applications of Bayesian nonparametric modeling. Prior probability models for spaces of functions. Dirichlet processes. Polya trees. Nonparametric mixtures. Models for regression, survival analysis, categorical data analysis, and spatial statistics. Examples drawn from social, engineering, and life sciences. (Formerly AMS 241.)

Prerequisite: Prerequisite(s): STAT 207. Enrollment is restricted to graduate students.

STAT 223 - Time Series Analysis (5)

Graduate level introductory course on time series data and models in the time and frequency domains: descriptive time series methods; the periodogram; basic theory of stationary processes; linear filters; spectral analysis; time series analysis for repeated measurements; ARIMA models; introduction to Bayesian spectral analysis; Bayesian learning, forecasting, and smoothing; introduction to Bayesian Dynamic Linear Models (DLMs); DLM mathematical structure; DLMs for trends and

seasonal patterns; and autoregression and time series regression models. (Formerly AMS 223.)

Prerequisite: Prerequisite(s): STAT 206B, or by permission of instructor. Enrollment is restricted to graduate students.

STAT 224 - Bayesian Survival Analysis and Clinical Design (5)

Introduction to Bayesian statistical methods for survival analysis and clinical trial design: parametric and semiparametric models for survival data, frailty models, cure rate models, the design of clinical studies in phase I/II/III. (Formerly AMS 276.)

Prerequisite: Prerequisite(s): STAT 207 or by permission of instructor. Enrollment is restricted to graduate students.

STAT 225 - Multivariate Statistical Methods (5)

Introduction to statistical methods for analyzing data sets in which two or more variables play the role of outcome or response. Descriptive methods for multivariate data. Matrix algebra and random vectors. The multivariate normal distribution. Likelihood and Bayesian inferences about multivariate mean vectors. Analysis of covariance structure: principle components, factor analysis. Discriminant, classification and cluster analysis. (Formerly AMS 225.)

Prerequisite: Prerequisite(s): STAT 206 or STAT 206B, or by permission of instructor. Enrollment is restricted to graduate students.

STAT 226 - Spatial Statistics (5)

Introduction to the analysis of spatial data: theory of correlation structures and variograms; kriging and Gaussian processes; Markov random fields; fitting models to data; computational techniques; frequentist and Bayesian approaches. (Formerly AMS 245.)

Prerequisite: Prerequisite(s): STAT 207. Enrollment is restricted to graduate students.

STAT 227 - Statistical Learning and High Dimensional Data Analysis (5)

Introductions to statistical learning, modeling, and inference with complex, large, and high-dimensional data. Topics include supervised and unsupervised learning, model selection, dimension reduction, matrix factorization, latent variable models, graphical models, interpretability and causality. Applications in health, social sciences, and engineering.

Prerequisite: Prerequisite(s): STAT 207. STAT 205 is recommended. Enrollment is restricted to graduate students.

STAT 229 - Advanced Bayesian Computation (5)

Teaches some advanced techniques in Bayesian Computation. Topics include Hamiltonian Monte Carlo; slice sampling; sequential Monte Carlo; assumed density filtering; expectation propagation; stochastic gradient descent; approximate Markov chain Monte Carlo; variational inference; and stochastic variational inference. (Formerly AMS 268.)

Prerequisite: Prerequisite(s): STAT 207, or by permission of the instructor. Enrollment is restricted to graduate students; undergraduates may enroll by permission of the instructor.

STAT 243 - Stochastic Processes (5)

Includes probabilistic and statistical analysis of random processes, continuous-time Markov chains, hidden Markov models, point processes, Markov random fields, spatial and spatio-temporal processes, and statistical modeling and inference in stochastic processes. Applications to a variety of fields. (Formerly AMS 263.)

Prerequisite: Prerequisite(s): STAT 205B or STAT 246, or by permission of instructor.

STAT 244 - Bayesian Decision Theory (5)

Explores conceptual and theoretical bases of statistical decision making under uncertainty. Focuses on axiomatic foundations of expected utility, elicitation of subjective probabilities and utilities, and the value of information and modern computational methods for decision problems. (Formerly AMS 221.)

Prerequisite: Prerequisite(s): STAT 206. Enrollment is restricted to graduate students.

STAT 246 - Probability Theory with Markov Chains (5)

Introduction to probability theory: probability spaces, expectation as Lebesgue integral, characteristic functions, modes of convergence, conditional probability and expectation, discrete-state Markov chains, stationary distributions, limit theorems, ergodic theorem, continuous-state Markov chains, applications to Markov chain Monte Carlo methods. (Formerly AMS 261.)

Prerequisite: Prerequisite(s): STAT 205B or by permission of instructor. Enrollment is restricted to graduate students.

STAT 266A - Data Visualization and Statistical Programming in R (3)

Introduces students to data visualization and statistical programming techniques using the R language. Covers the basics of the language, descriptive statistics, visual analytics, and applied linear regression. Enrollment is by permission of the instructor. (Formerly Applied Math and Statistics 266A and Computer Science 266A.)

STAT 266B - Advanced Statistical Programming in R (3)

Teaches students already familiar with the R language advanced tools such as interactive graphics, interfacing with low-level languages, package construction, debugging, profiling, and parallel computation. (Formerly Applied Math and Statistics 266B and Computer Science 266B.)

Prerequisite: Prerequisite(s): STAT 266A or CSE 266A.

STAT 266C - Introduction to Data Wrangling (3)

Introduces students to concepts and tools associated with data collection, curation, manipulation, and cleaning including an introduction to relational databases and SQL, regular

expressions, API usage, and web scraping using Python. (Formerly Applied Math and Statistics 266C and Computer Science 266C.)

Prerequisite: Prerequisite(s): STAT 266A or CSE 266A.

STAT 280B - Seminars in Statistics (2)

Weekly seminar series covering topics of current research in statistics.

Prerequisite: Enrollment is restricted to graduate students.

STAT 280D - Seminar in Bayesian Statistical Methodology (2)

Weekly seminar/discussion group on Bayesian statistical methods, covering both analytical and computational approaches. Participants present research progress and finding in semiformal discussions. Students must present their own research on a regular basis. (Formerly AMS 280D.)

Prerequisite: Enrollment is restricted to graduate students.

STAT 285 - Seminar in Career Skills (2)

Seminar in career skills for applied mathematicians and statisticians. Learn about professional activities such as the publication process, grant proposals, and the job market.

Prerequisite: Enrollment is restricted to graduate students, typically within two years of their expected Ph.D. completion date.

STAT 291 - Advanced Topics in Bayesian Statistics (3)

Advanced study of research topics in the theory, methods, or applications of Bayesian statistics. The specific subject depends on the instructor. Enrollment is restricted to graduate students and by permission of instructor. (Formerly AMS 291.)

STAT 296 - Masters Project (2)

Independent completion of a masters project under faculty supervision. Students submit petition to sponsoring agency. Enrollment is restricted to graduate students.

STAT 297A - Independent Study or Research (5)

Independent study or research under faculty supervision. Students submit petition to sponsoring agency. Enrollment is restricted to graduate students.

STAT 297B - Independent Study or Research (10)

Independent study or research under faculty supervision. Students submit petition to sponsoring agency. Enrollment is restricted to graduate students.

STAT 297C - Independent Study or Research (15)

Independent study or research under faculty supervision. Students submit petition to sponsoring agency. Enrollment is restricted to graduate students.

STAT 297F - Independent Study (2)

Independent study or research under faculty supervision. Students submit petition to sponsoring agency. Enrollment is restricted to graduate students.

STAT 299A - Thesis Research (5)

Thesis research under faculty supervision. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

STAT 299B - Thesis Research (10)

Thesis research under faculty supervision. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

STAT 299C - Thesis Research (15)

Thesis research under faculty supervision. Students submit petition to sponsoring agency. Enrollment restricted to graduate students.

STEV - STEVENSON COLLEGE**Lower-Division****STEV 1 - Academic Literacy and Ethos: Self and Society (5)**

Teaches foundational concepts for intellectual exploration and personal development within an academic community: analysis, critical thinking, metacognition, engagement with others across difference, and self-efficacy. Examines the roots of modern society using diverse religious texts and major classical and modern philosophical works.

Prerequisite: Enrollment is restricted to first-year college members.

STEV 1A - Introduction to University Life and Learning (1)

Orientation to and an exploration of the nature of the liberal arts, and of learning at research universities. Topics include: academic planning for upper-division coursework; enrollment processes; and understanding pathways to degree completion; UCSC resources that support health and well-being; strategies for academic success; the cultivation of just communities; the prevention of sexual harassment and violence; campus conduct policies; awareness of risks associated with drug and/or alcohol use; and an introduction to traditions of community-engaged learning, ground-breaking research, and interdisciplinary thinking that define a UC Santa Cruz degree. This course can be taken for Pass/No Pass grading only.

Prerequisite: Enrollment is restricted to entering first-year Stevenson College students.

STEV 2 - Self and Society 2 (5)

Winter quarter of Stevenson's core course continues development of analytical writing, critical reading, and effective speaking in exploring conflicts inherent in modern society. Investigates themes of colonization, race, gender, class, and cultural conflict. (Formerly course 81A.)

Prerequisite: Enrollment is restricted to first-year and sophomore college members.

STEV 10 - Skills for College and Beyond (2)

Applications of practical skills for effective, meaningful study in the context of a full, busy life. Topics include learning styles, time management, test preparation, and life balance. Specific techniques for efficient reading comprehension, note-taking, memorization, and self-assessment are introduced. Enrollment restricted to college members and by permission of instructor.

STEV 16 - Stevenson Community Garden (2)

Hands-on course in ecological horticulture at the Stevenson garden. Students grow the Stevenson community through gardening and projects focused on building a healthy and regenerative local-foods culture. Enrollment by interview only. Enrollment restricted to Stevenson College members.

STEV 18 - Eighteenth Century Kabbalistic Thought and Literature (2)

Emphasis on analyzing (translations of) original text to explore critical areas of kabbalistic thought, including tzimtzum, the sefirot, theodicy, and hermeneutics.

STEV 21 - Citizens and Nations: Self and Society in the 19th Century (2)

A reading seminar focusing on a set of key texts. Examines how the political and industrial revolutions of the 19th century fundamentally transformed the relationships between individuals and their respective societies.

Prerequisite: Enrollment is restricted to Stevenson College members.

STEV 22 - Self and Society in Classical Social Theory (2)

Reading seminar focusing on a set of key texts from classical social theory. Explores the transition from traditional to modern societies. Authors addressed may include Locke, Rousseau, de Tocqueville, Marx, Weber, and Durkheim.

Prerequisite: Enrollment is restricted to Stevenson College members.

STEV 23 - Monsters and the Monstrous in the Early British Novel (5)

Examines figurations of monsters and the monstrous in the 18th- and 19th-Century British novel to explore the function of monsters as cultural tools for affirming and subverting social boundaries.

STEV 24A - Cultural Intelligence: Developing a Higher CQ (Cultural Intelligence) (2)

We begin by examining the three basic facets involved in developing one's cultural intelligence (CQ): cognitive, motivational, and behavioral. Topics include: complexities of intercultural communication; importance of cultural self-identity and filters; power and privilege; and their impact on one's perceptions. (Formerly course 24.)

STEV 24B - Developing Facilitation Skills for Cultural Intelligence (2)

Presents six dimensions of facilitation: goal development, cognitive aspects, confronting resistance, managing emotions, methods of learning, and creating a supportive and respectful climate. Students practice different styles of facilitation to learn which one(s) fit their personal styles and goal(s) for any given workshop. The importance of developing cultural intelligence is presented as well. Students must be available to facilitate diversity trainings. Enrollment is restricted to sophomores, juniors, seniors, and graduate students and by instructor consent.

STEV 26 - Navigating the Research University (2)

Explores critical engagement in education in the context of a research university. Introduces first-year issues and success strategies and ways to participate in the institution's academic life. Investigates strategies for clarifying education goals and devising a plan for success. Students cannot receive credit for this course and PRTR 26 or KRSG 26.

Prerequisite: Enrollment is restricted to first-year students.

STEV 27 - Service Learning (2)

This online course frames and supports the service-learning experiences of students engaged in field placements both here in Santa Cruz and in their home communities. Students approach social challenges thematically (e.g., homelessness, environmentalism, domestic violence, etc.) and consider how different disciplines might engage these issues. They consider how our community partners conceptualize and address social issues and how these conceptions connect, or fail to connect, with academic approaches,

STEV 30 - Thesis Writing and Editing (2)

Identifies and examines the assumptions, expectations, and formats of writing in students' fields, with the goal of beginning—or continuing—academic research. Prerequisite(s): satisfaction of the Composition requirement. Enrollment restricted to junior and senior college members and by permission of instructor.

STEV 33 - Self and Society Examined Through Ethical Dilemmas (2)

Examines ethical dilemmas in contemporary topics, such as the status of moral principles during warfare; animal rights and the ethics of eating meat; privacy in the age of the Internet; imprisonment and rehabilitation; legal and illegal immigration; same-sex marriage; and health care.

STEV 35 - Everyday Ethics for College Life (2)

Exploration of and reflection on everyday values and virtues such as integrity, open-mindedness, honesty, and community. Objectives include learning how to think about moral dilemmas and how to begin drafting one's own code of ethics.

Prerequisite: Enrollment is restricted to college members.

STEV 36 - Women in the Bible (5)

A seminar-style course intended to sharpen analytical skills by critically analyzing biblical narratives about women: stories about heroism, betrayal, love, loyalty, infidelity, motherhood, and leadership. Students explore biblical personalities and perspectives, analyzing how these are conveyed in the biblical narrative.

STEV 37 - Critical Thinking and Skepticism (5)

Focuses on the acquisition and application of critical thinking skills and examines skeptical perspectives on a variety of issues. Topics include rationality, fallacies, cognitive biases, religion and the paranormal, media biases, and the costs and benefits of arguing with people.

STEV 40 - The Self Under Moral Siege: Challenges for the Individual in 20th-Century Totalitarian Europe (2)

Examines how individuals and communities confronted dilemmas when laws, state ideology, and war challenged traditional morality. Themes include: ethics, responsibility, victimhood, moral compromise, retribution, and reconciliation.

Prerequisite: Enrollment priority given to Stevenson College students.

STEV 41 - Spirituality in a Modern World (2)

Investigates scientific and pragmatic perspectives on spirituality from William James to Fritjof Capra. Explores spirituality in Western and Eastern traditions from Martin Buber to Pema Chodron. Students analyze, support, and articulate their spiritual positions in a culminating paper.

Prerequisite: Enrollment is restricted to Stevenson College members.

STEV 43 - Comparative Nationalisms in Historical Perspective (5)

From the white nationalist demonstrations in the USA to Brexit and the resurgence of populist movements in India and Europe, nationalism is resurgent worldwide. In this course, students conduct research into a current nationalist movement of their choice.

Prerequisite: Enrollment restricted to students in the College Scholars Program.

STEV 50A - Stevenson Alumni Careers in Law (2)

Connecting Stevenson students with alumni who provide practical advice for careers in law. Topics covered include the variety of career possibilities in law, preparing for law school, internships, networking, applying for jobs, and interviewing.

Prerequisite: Enrollment is restricted to College members.

STEV 50B - Stevenson Alumni Careers in Science and Technology (2)

Connecting Stevenson students with alumni who provide practical advice for careers in science and technology. Topics covered include internships, graduate school, networking,

applying for jobs, interviewing, and adapting to a rapidly changing job market.

Prerequisite: Enrollment is restricted to College members.

STEV 60 - Centering Black Women as Leaders (5)

Interrogates the leadership of Black women through the lens of critical race/feminist/leadership theories, examining the narratives on BW leaders in case studies. Students will examine their own development and learning in our oppressive context.

STEV 80F - Academic Success in the College Core Course (3)

Provides support for reading, understanding, and engaging with difficult Core texts; models and facilitates college-level discussion; provides instruction in collaborative processes; encourages community-building with the college; and helps acclimate students to university culture. Enrollment is restricted to first-year Stevenson students who have been placed in the Multilingual Curriculum.

STEV 80G - Self and Society Through Film (5)

Uses feature films and documentaries to address and discuss perspectives of self and society. Films include Star Wars, The Hunger Games, and The Matrix.

STEV 80H - Rainbow Theater: An Introduction to Multicultural Theater (5)

Introduction to Asian American, Chicano/Latino, and African American plays through reading of major authors, discussion of social and historical context of their work, and development of a production of a one-act play from each cultural group. In-depth examination of key historical context of these three cultural groups. Video presentations followed by class discussion. Enrollment by audition.

STEV 80T - Self and Society for Transfer Students (5)

Condensed version of Stevenson's core course for transfer students. Develops analytical writing, critical reading, and effective speaking by considering influential philosophical works while exploring cultural conflicts in modern society. Themes include imperialism, racism, and class conflict.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to college members.

STEV 90 - The Nuclear Pacific (5)

Examines the history of nuclear weapons and nuclear power in the Pacific region from 1945 to 2013. Students do research on nuclear science, medicine, energy, and weapons testing and their social, political, demographic, and environmental impacts.

Prerequisite: Enrollment is restricted to College Scholar Students.

STEV 96 - Theory and Practice of Peer-Guided Learning for Tutors and Learning Assistants (2)

Provides first-time tutors and supplemental-instruction learning assistants with the theoretical background and practical

interactive teaching and learning strategies essential for planning, implementing, and evaluating effective peer-guided learning.

STEV 99 - Tutorial (5)

Tutorial

Upper-Division

STEV 120 - Self and Society: Teaching Practicum (5)

In pairs, students facilitate one seminar section of STEV 2, attend lectures, and meet with faculty for mentoring and guidance through the teaching process. Students are responsible for designing and executing lesson plans, creating assignments, and for evaluating student work. Prerequisite(s): STEV 80 or STEV 1, and STEV 81 or STEV 2. Admission to the program by application and subsequent interview. Applications are available each fall in early October from the college office and interviews are conducted in early November. Qualifications include, but are not limited to, excellent performance in the core courses, good academic standing, leadership experience, genuine passion for teaching, and caring for fellow students. Strong candidates will be skilled in time management, organization, communication, and judgment.

STEV 121 - Advanced Research and Strategic Planning for Graduate School (5)

Guided by a faculty mentor, students engage in an advanced research experience including developing a research proposal, conducting research, and writing and presenting a research paper. Students also prepare for graduate school by practicing the graduate school application process. Enrollment is restricted to students accepted into the Educational Opportunity Programs faculty mentor program. Enrollment also restricted to junior and senior majors in the Divisions of Arts, Humanities, and Social Sciences.

STEV 192 - Directed Student Teaching (5)

Teaching of a lower-division seminar under faculty supervision (see course 42). Prerequisite(s): upper-division standing and a proposal supported by a faculty member willing to supervise.

STEV 193 - Field Study (5)

Provides for individual programs of study, sponsored by the college and performed off-campus. This course may be counted for up to three courses of credit in any quarter. Prerequisite(s): approval of student's adviser and the academic preceptor, and, in the case of full-time study, the board of studies supervising the major.

STEV 194 - Group Tutorial (5)

A program of independent study arranged between a group of students and a faculty instructor. Enrollment restricted to members of Stevenson College. Enrollment limited to 12.

STEV 194F - Group Tutorial (2)

A program of independent study arranged between a group of students and a faculty instructor. Course designed for members

of Stevenson College. Students submit petition to sponsoring agency. Enrollment limited to 10.

STEV 198 - Independent Field Study (5)

Provides for college-sponsored individual study programs off campus, for which faculty supervision is not in person (e.g., supervision is by correspondence). Up to three such courses may be taken for credit in any one quarter. Prerequisite(s): approval of the student's adviser, certification of adequate preparation, approval by the academic preceptor.

STEV 198F - Independent Field Study (2)

Provides for college-sponsored individual study programs off campus, for which faculty supervision is not in person (e.g., supervision is by correspondence). Up to three such courses may be take for credit in any one quarter. Students submit petition to sponsoring agency. Requires approval of the student's adviser and academic preceptor

STEV 199 - Tutorial (5)

Individual projects carried out under the supervision of a Stevenson faculty member. Students submit petition to sponsoring agency.

STEV 199F - Tutorial (2)

Individual projects carried out under the supervision of a Stevenson faculty member. Students submit petition to sponsoring agency.

THEA - THEATER ARTS

Lower-Division

THEA 7 - The Arts Dean's Lecture Series on the Art of Change with Lyle Troxell of Netflix (2)

Course features a distinguished roster of guest speakers of arts practitioners and educators who provide illuminating insights and personal stories on the artistic character that can shape a creative life dedicated to social change. Speakers cover a lively range of topics, ranging from the importance of habits of heart and mind that can transform "some thing" into something "original" to the ways the arts create productive change. Taught by Lyle Troxell, host of the WeAreNetflix Podcast. (Formerly Arts Dean's Lecture Series on Creative Entrepreneurship.)

THEA 8 - Introduction to Iranian Theatre (2)

Introduces Iranian theater covering Ta'zieh religious performance, Ruhuzi improvised drama, Naghali storytelling, and modern efforts in national and diasporic theaters fusing indigenous and western styles. No prior knowledge of Iran is required and readings are in English.

THEA 10 - Introduction to Theater Design and Technology (5)

Addresses imagination and creativity. Using the framework of theater production, students explore the process of translating a script into a performance. Topics include visual literacy, creative problem solving, establishing effective working teams, tear sheets, storyboarding, drawing, sound and color theory.

This course is a prerequisite for all upper-division design courses.

THEA 12 - Stage Management (5)

Designed to acquaint students with the complexities of staging productions from the audition process to final performance. Directing, lighting, scenic production, sound, cueing, and personnel management are aspects that will be touched upon in class.

THEA 14 - Drawing (5)

A fundamental course in drawing from still life, the figure, and in the landscape. The approach is from the tonal and volumetric aspects of the object. Color is introduced as the course progresses. Instruction fashioned to the individual needs of the student. The inexperienced are welcomed as well as the experienced.

THEA 15 - Special Topics in Textiles (5)

Introduces varied techniques in textile manipulation to create scenic and costume-design properties including drapery, upholstery, masks, bags, and millinery. Students learn basic sewing and surface-design methods, such as knitting, screen-printing, painting/dyeing, and distressing.

THEA 17 - Costume Construction (5)

The process of interpreting a costume designer's sketch into a finished theatrical costume. Some techniques included are dyeing, fabric selection, draping, flat pattern drafting, pattern manipulation, adaptation, fitting, and alteration. Using various techniques, students make basic pattern pieces and learn to modify them to create costumes.

THEA 18 - Drafting for Theatrical Production (5)

An examination of the fundamentals of drafting scale drawings for production, including floor plans, elevations, sections, working drawings, dimensions, layout, and lettering. Students learn isometric drawing, perspective, and rendering techniques.

THEA 18C - Drafting-Computer Aided (5)

In-depth exploration of computer-aided drafting, specifically the programs Vectorworks, Spotlight, and Renderworks. Topics include: the user interface, ground plan, section and detail views, paper space vs. working space, tool palettes, USITT drafting standards, layers, line weights, objects, classes, library annotations, importing rasters, and 3D modeling. Students required to do weekly projects such as ground plans, lighting plots, perspectives, and detail drawings, as well as turn in a major final project, and complete a mid-term, final, and quizzes.

Prerequisite: Enrollment is restricted to theater arts majors.

THEA 19 - Design Studio: Lighting Studio A (5)

An introduction to the theory and practice of lighting design with attention to the practical skills and creative approaches to lighting performance pieces; the technical side of lighting design via demonstrations, lectures, and labs. Students complete projects evolving and executing concepts for lighting chosen pieces.

Prerequisite: Prerequisite(s): THEA 10.

THEA 20 - Introductory Studies in Acting (5)

Introduction to basic acting skills and the problems of performance. Concentrates on expanding a range of expression and ability to respond to and analyze dramatic text. Designed for students with little or no experience in acting.

THEA 21 - Acting Studio I: Psychological Realism (5)

Explores the fundamentals from the work of Konstantin Stanislavski as developed at the Moscow Art Theater to the works of his and our contemporary playwrights. Specifically, students apply those techniques of action, physical score, given circumstances, subtext, interior monologue, goals, and objectives, throughline, superobjective, and emotional recall to works of Henrik Ibsen, Anton Chekov, and relevant American realists, such as Sam Shepard, August Wilson, etc. Designed for students focused on acting as an academic or professional discipline. Admission by audition at first class meeting (see the department office or theater.ucsc.edu for more information). (Formerly course 21A, Acting Studio 1A: Psychological Realism.)

THEA 22 - Indonesian Dance and Drama (5)

Students learn the basic movement repertoire of the specific characters of the Indonesian dance-drama/puppetry tradition over the quarter with explication of how these types operate in their own cultural context. Course culminates in an open showing of scene work.

THEA 23 - Voice for the Actor (5)

Introduces using the spoken voice effectively and powerfully on stage and off. Physical release, alignment, breath, resonance, and articulation are explored. Students gain an understanding of how the voice relates to the self, the body, and breath and become more aware of tensions and habits that may impede vocal and speech use.

THEA 24 - Movement for Performers (5)

Students develop awareness and extension of personal movement repertoire through observation, movement experience, and exploration.

THEA 25 - Understanding Shakespeare (5)

Emphasizes key theoretical and practical modes of dramaturgy in order to research, analyze, and interpret the dramatic works and performances of Shakespeare within historical and contemporary contexts.

THEA 30 - Introduction to Dance Theory and Technique (5)

Intensive instruction in developing the dancer's mind/body, with introduction to movement theory and practice.

THEA 31A - Dance Studio I: Asian or Asian Diasporic Practice (5)

Introduces Asian or Asian diasporic dance practice through physical training and theoretical engagement. Focuses on basic

techniques of performance practice and critical engagement with aesthetic, cultural, and/or historical context.

THEA 31B - Dance Studio I: Ballet (5)

Introduces classical ballet as a form of ethnic dance. Focus on combining basic training in ballet technique with academic studies to achieve a synthesis in the understanding of dance as a performing arts practice in diverse socio-cultural and historical contexts. Emphasis on simple phrasing and articulation into more complex material requiring richer dynamic range. Attention to the anatomical principles that governs ballet mechanics.

THEA 31C - Dance Studio I: Contemporary Dance Theory and Technique (5)

Intensive instruction in contemporary dance technique. Combining movement theory and practice, students will develop basic knowledge of anatomical function (somatics) and a foundational embodiment of contemporary dance technique.

Prerequisite: Prerequisite(s): THEA 30.

THEA 31E - The Dance Experience (2)

Introduction to contemporary dance theory and practice. Focus on basic dance technique, range of styles, and aesthetic points of view of historically significant contemporary dance choreographers in America and worldwide.

THEA 33C - Dance Studio I (5)

Intensive instruction in developing the dancer's physical instrument. Intended for students who have a previous fundamental knowledge of the basics of classic dance, combined with movement theory.

Prerequisite: Prerequisite(s): THEA 30.

THEA 36 - Introduction to Dance Composition (5)

Introduces dance improvisation and choreographic practice. Observation and recognition of personal movement patterns and discovering new sources for creative material.

THEA 37 - African Dance (5)

A griot (musician-entertainer from western Africa) from Burkina Faso teaches The African Journey, which emphasizes dance as combined in Africa, including singing, history, oral tradition, and storytelling.

THEA 38 - Dance on Film (2)

Introduces dance on film, examining such topics as narrative storytelling in dance films (documentary and fiction); cinematic strategies for representing the kinesthetic; and dance film as a unique and distinct art form.

THEA 40 - Introduction to Directing (5)

An overview of the analytical and creative processes that inform the director's work. Close examination of texts, concepts, and selected directors and directorial choices.

THEA 41 - Fundamentals of Directing (5)

An experience designed to develop an active and creative vision leading to a concept that takes an audience on a memorable journey with lives that are created on the stage. Students direct a monologue, a dual scene, and a final project which represents the collaborative nature of the art of directing. Topics include blocking techniques, history of directing, how to work with designers, rehearsal techniques, and strategies for actor coaching.

THEA 50 - Fundamentals of Theater Production (2)

Work is on various aspects of theatrical production, including scenery, lighting, costumes, sound, stage management, and video documentation. Satisfies the department's technical experience requirement.

THEA 52 - Basic Stagecraft (5)

Provides introduction to technical theater and basic stagecraft. Course examines two-dimensional and three-dimensional scenery, scenic engineering, the physical theater, stage and scene shop equipment, project organization and process, technical theater graphics, materials, and theatrical construction techniques.

Prerequisite: Prerequisite(s): THEA 10.

THEA 55A - Workshop in Performance: Barnstorm (5)

Process-oriented investigation of practical theater production by working in and on productions in the Barnstorm season. Requires a total of 150 hours working backstage or onstage. Admission by audition at first class meeting; see department office for more information.

THEA 55B - Workshop in Performance: Barnstorm Lab (2)

Process-oriented investigation of practical theater production by working in and on productions in the Barnstorm season. Requires a total of 50 hours working backstage or onstage. Admission by audition at first class meeting; see department office for more information.

THEA 61A - Ancient and Medieval Drama (5)

Ancient enmities; horrific acts of parricide; monumental errors; suffering and contrition. This course examines the enormous appeal of the ancient Greek tragic and comic visions from their inception through their enthusiastic adaptation by the Romans and on into the Middle Ages. For comparison purposes, Greek and Roman dramas are studied back-to-back with the contemporary non-Western dramatic forms of Noh and ancient Sanskrit drama.

THEA 61B - Drama from the Renaissance to the Modern Age (5)

Examines major trends in European drama from the rediscovery of ancient Greek and Roman drama in the early 17th century to the late 19th century. Examines major trends in European drama from the discovery of ancient Greek and Roman drama in the early 17th century to the late 19th century. These trends include neo-classical drama, the rise of middle-class drama, social realism, romanticism, early naturalism, and the well-

made play. These trends are compared with the parallel developments of the non-Western forms of Japanese Kabuki and Javanese Wayang.

THEA 61C - The Birth of the Modern: Drama and Performance After the Renaissance (5)

Examines dramatic and theatrical works that sprang into being in the wake of the European Renaissance. Follows the ways modern artists have dramatized their questions, struggles, beliefs, and despair in the face of world wars, cultural fragmentation, unprecedented prosperity, and new technologies.

THEA 64 - Shakespeare and Adaptation in Text and Performance (5)

Juxtaposes Shakespeare's plays with sources Shakespeare may have adapted and adaptations that his works, in turn, have spawned. Explores Renaissance stage and printing practices and the processes of adapting for page and stage.

THEA 80A - Introduction to African American Theater (5)

Surveys African American theater from late-19th-century to contemporary 21st-century playwrights and examines dramatic narratives to trace creation, evolution, and development of African American cultural identity formation in American theater.

THEA 80B - Rock 'n' Roll Design (5)

Examination of the genesis, history, and development of technical theater practices used in large arena rock shows. Topics will include the development of rigging practices used in arenas, touring logistics, lighting instrumentation and aesthetics of rock shows, and the nature, practice, and approach of sound in these venues.

THEA 80C - Monsters (5)

Examines the operation of monsters in plays from Ancient Greece to today, inquiring as to why these powerful cultural tools for the expression of social tension show no sign of diminishing despite our ostensible advance into scientific rationalism.

THEA 80D - Commercial Design 1900 to Present (5)

History of 20th-century commercial design for the theater through the eyes of the Western consumer.

THEA 80H - Hamlet Conundrums (5)

Offered online, the course explores major issues of interpretation of Shakespeare's classic play, which has occupied the minds of audiences, directors, designers, performers, and critics during its 400-year history. In doing this, it offers a sense of history of people's preoccupations with and thoughts about the play. Students taking this class are expected to complete the course during the quarter for which they are enrolled. All students enrolled in this course should visit elsinore.ucsc.edu and write to elsinore@ucsc.edu.

THEA 80K - Shakespeare 4every1 (5)

Introduces all students, regardless of experience, to the plays and theater of Shakespeare, and directly addresses linked relevance to contemporary 21st century American culture.

THEA 80L - Muppet Magic: Jim Henson's Art (5)

The artistic and social impact of the Muppets on American puppetry, children's television, and Hollywood film is explored through viewings, guest lectures, and analysis. Henson's legacy in artistic innovation, mainstreaming of puppet theater for adult audiences, and establishment of puppetry in media and marketing are also explored.

THEA 80M - Chicano/a Teatro (5)

Introduction to Teatro Chicano/a with examination of how cultural diversity plays a role in theater. Through lectures, films, and workshop exercises, reflect upon the process of Teatro Chicano. Students write their own acts, improvise, and perform in class.

THEA 80N - Walt Disney (5)

An examination of Walt Disney's creation of the American vision of family entertainment. Particular attention will be paid to the classic animated feature films of Walt Disney and to the way this Disney invention has been preserved and developed since his death. We will also look at the live action films, theme parks, and other Disney creations.

THEA 80P - Pixar - Story Matters (5)

Emphasizes script development by exploring dramatic writings from ancient to contemporary theater, then focusing on Pixar screenplays with their universal themes and compelling characters. Film analysis of Pixar movies delves into animation history, fairytale, psychology, and popular culture.

THEA 80Q - Introduction to Queer Theater (5)

Examines the history of the queer perspective in dramatic literature, from the Greeks to Marlowe and Shakespeare through the calcification of homosexuality in the era of Freud, then traces theater stewardship by gay and lesbian artists from within the closet and without.

THEA 80R - Bollywood Dance and Culture in India and Indian Diaspora (5)

Bollywood is the largest film industry in the world. Students learn several fundamental footsteps, eye, hand and body movements, to perform Bollywood dance. They also learn various traditions of Indian classical, folk, and Bollywood dance terms.

THEA 80S - Theater Arts Education and the Community (5)

This course is designed to develop ways in which we can direct our interest in the arts into concrete and successful community projects. Although the emphasis will be on developing skills to work within K-12 classrooms, other community projects will be discussed and designed.

THEA 80T - Flashmob! Mass Performance in the Information**Age (5)**

Flashmobs represent a new social configuration using information technology. Course covers the history of experiments in art and technology and the role of mass performance in society. Students consider the socio-cultural ramifications of flashmobs and participate in them.

THEA 80U - Everybody Dance Now! (5)

Examines dance as a primary mode of human communication and expression. Through readings and the viewing of recorded and live performances, students compare and contrast dance traditions of the world.

THEA 80V - The Circus in American Culture (5)

Circus arts from their shamanic roots to contemporary practice will be analyzed in a historical, aesthetic, and creative dimension. Lecture, discussion, and demonstrations will explore the theory and practice of American circus arts. In section, students will explore basic circus skills from clowning to tumbling to exhibition of freaks.

THEA 80X - The Performance of Story in Theater and Film (5)

An examination of the theory and practice of theater and film, comparing and contrasting works that have been adapted from one genre to another. Lecture, film and video viewing and discussion of materialist, psychoanalytic, and feminist approaches will be shared.

THEA 80Y - American Musical Theater (5)

The history of American musical theater, from its roots to today, is studied through scripts, scores, and film. Major composers and lyricists' work is shown, discussed, and analyzed.

THEA 80Z - Indian Dance (5)

Study of Indian classical dance through embodied training and theoretical engagement. Training in the foundational elements of abstract rhythmic dance, including drum syllables and associated steps, and introduction to abhinaya (storytelling).

THEA 99 - Tutorial (5)

Students must file their petitions for this course with the department office by the end of the fifth day of instruction in the quarter in which they would like to take the tutorial. Prerequisite(s): petition required, approved by instructor and department.

Upper-Division**THEA 100A - Asian Theater/Dance and Global Impacts (5)**

Overview of selected theater/dance performance genres of India, Indonesia, China, Korea, and Japan with attention to how cultural, political, and social flows have impacted contemporary performance in Asia and beyond. Lectures supplemented by workshops.

THEA 100B - Black Theater USA (5)

Spanning slavery, emancipation, reconstruction, the great depression, civil rights, and the black power/black arts movements, course explores African American drama from literary, historical, and biographical perspectives in lecture/discussions, film excerpts, dramatizations, and visits from award-winning guests.

THEA 100C - Courts, Courtesans, Shamans, and Clowns: Asian Drama (5)

Asian court and popular performance are traced. Sanskrit drama is contrasted with Indian epic recitation, medium, and courtesan dance. Gender specialization is noted in Indonesian courts using Indian and local legends in dance, mask/puppetry, and clowning. Buddhist and Confucian impulses in Chinese theater and early Korean and Japanese mask and puppetry are introduced. Students are evaluated on participation, tests, writing, and a performance project.

THEA 100W - Black/African Diasporic World Theater (5)

Examines major black African diasporic playwrights and theater. Focuses on the historical, cultural, and literary contexts that gave rise to the works of dramatists such as Ama Ata Aidoo, Derek Walcott, Wole Soyinke, Aime Cesaire, Debbie Green Tucker, and Paul Boakye.

Prerequisite: Prerequisite(s): THEA 61 or THEA 60A or THEA 60B or THEA 60C.

THEA 103 - Design Concept Development (5)

Students develop an advanced design project related to theatrical production, apparel or housewares, marketing collateral, packaging or product development, or any related fields. Students address research and development, materials sourcing, budgeting, fabrication, and portfolio-quality presentation materials. Prerequisite(s): THEA 10; or two courses from ART 10D, ART 10E, and ART 10F. Enrollment is by permission of the instructor. THEA 106 is recommended as preparation.

THEA 104 - Multimedia Authoring (5)

Introduces students to basic tools for the creation of multimedia digital projects. Special attention is given to the integration of video, sound, graphics, text and virtual reality and to the creation and execution of strategies for interaction between users and the projects themselves. With this in mind, students design and create computer puzzles and games.

THEA 106 - Digital Illustration (5)

Introduces digital rendering techniques using the Adobe Creative Suite. Using Adobe Creative Suite, students solve design problems. Enrollment by permission of the instructor.

THEA 108 - Theater and Interaction Design (5)

Investigates interactive media including computer games, virtual reality, and participatory theater to inform design practice. Examines Aristotle's Poetics with some modernist

excursions. Also examines the various values embedded in works--artistic, civic, spiritual, and political.

Prerequisite: Enrollment is restricted to juniors and seniors.

THEA 113 - The History of Design for Theater (5)

The development of scenic design from the Greek period to the present. Concentration is on the changing styles of set design in relation to the changing attitudes toward dramatic literature, art, and theater architecture.

THEA 114 - Sound Design and Engineering for the Theater (5)

Mixing theory with practice, this course covers everything from script analysis and sound-design paperwork to how to use the software and hardware needed to bring a sound design to reality.

Prerequisite: Prerequisite(s): THEA 10.

THEA 115A - Design Studio: Scenic Design (5)

Advanced work in principles and theory of scenic design.

Prerequisite: Prerequisite(s): THEA 10.

THEA 115B - Design Studio: Scenic Design B (5)

Advanced theory and practice of theatrical set design.

Prerequisite: Prerequisite(s): THEA 115.

THEA 116A - History of Clothing and Costume (5)

Survey of clothing and theatrical costumes; emphasis on dress of the audience and actor in historical periods of theatrical activity. Students are billed a materials fee.

THEA 117 - Design Studio: Costume (5)

Students learn advanced principles and theory of costume design, and apply these toward a large project for theatrical/film production or for character design for animation and gaming.

THEA 117A - Advanced Costume Construction (5)

Advanced principles in costume construction, including tailoring, advanced pattern drafting, and draping techniques. Focuses on translating modern techniques into historical garment construction. Teaches how to study artifacts and do primary research to unlock the past.

Prerequisite: Prerequisite(s): THEA 17.

THEA 118 - Design Studio: Scene Painting (5)

Emphasis on techniques used in painting scenery for the theater.

Prerequisite: Prerequisite(s): THEA 10.

THEA 119 - Design Studio: Lighting Studio B (5)

The theory and practice of lighting design with emphasis on practical application. Light plots, electricity, optics, design, and manipulation of lighting for the theater and related performance events are investigated. The student explores mechanics and aesthetics with hands-on experience.

Prerequisite: Prerequisite(s): THEA 19.

THEA 120 - Voice and Movement for Performers (5)

Intensive work on the voice and body involving breathing, relaxation, and an understanding of anatomy as it pertains to voice and movement. Awareness and extension of personal vocal and movement repertoire through observation, experience, and exploration. Active preparation for performance (emphasizing Shakespeare) with work on phonetics and scansion and integration of physical technique.

THEA 121 - Acting Studio II: Shakespeare (5)

This acting studio centers around Shakespeare and specific techniques used in performing his plays. Continues concentrated work on basic acting skills and textual analysis through scene study. Courses 21 and 23 are recommended as preparation. Admission is by audition at the first class meeting (see the department office or theater.ucsc.edu for more information). (Formerly Acting Studio II.)

THEA 122 - Indian Performance: Rama, Siva, Krishna (5)

Study of the classical theater and dance of India, with attention to performance practice, aesthetic theory, relationship to religious practice devoted to Rama, Siva, and Krishna, political implications and intercultural experimentation.

THEA 123 - Acting and Shakespeare (5)

Challenges of performing Shakespearean and Renaissance plays are explored through confronting the acting problems they pose. Attention to verse scansion, character analysis, and textual meaning. Strategies for enacting scenes and monologues are tested in class presentations.

THEA 124 - Movement for Performers (5)

Awareness and extension of personal movement repertoire, through observation, movement experience, and exploration.

THEA 126 - Acting Studio III (5)

Individual work on acting skills and problems, with emphasis on individual interpretation and scene work with other students. THEA 21 and THEA 124 are recommended as preparation. Admission is by audition at the first class meeting (see the department office or theater.ucsc.edu for more information).

THEA 126M - The Meisner Technique: A Practical Exploration (5)

An intensive immersion into the teaching techniques and actor-training originated by Sanford Meisner. Presents exercises and projects utilizing improvisation, physical activities, and, finally, memorized text. THEA 21 and THEA 124 are recommended as preparation. Admission is by audition at the first class meeting (see the department office or theater.ucsc.edu for more information).

THEA 128 - Choreographic Workshop (2)

Intensive upper-division choreographic workshop that begins from the key motifs of historical dance to develop original

work. Dancers made available to the student choreographers. Concurrent enrollment in THEA 139 is required.

THEA 131A - Dance Studio II: Asian or Asian Diasporic Practice (5)

Continues the study of an Asian or Asian diasporic dance theory and practice. Focuses on intermediate dance technique, refinement of performance expression, and creative ownership of material, alongside critical engagement with aesthetic, cultural, and/or historical context.

Prerequisite: Prerequisite(s): THEA 31A or permission of instructor.

THEA 131B - Dance Studio II: Ballet (5)

Continued study of classical ballet theory and practice with progressions in barre, center, and across the floor exercises. Focus on contemporary ballet and critical dance studies. Emphasis on musicality, strength and coordination, and refinement in epaulement in adagio and allegro sequences. Attention to body alignment and maintaining the kinetic integrity of the body while moving through space.

Prerequisite: Prerequisite(s): THEA 31B or by permission.

THEA 131C - Dance Studio II: Advanced Contemporary Forms and Practices (5)

Continued study of contemporary dance theory and practice. Focus on intermediate dance technique, individual and group movement invention, choreographic voice, and theatrical applications.

THEA 135 - Choreography I (5)

Students explore sources for movement; gain expressivity in a wide range of movement elements; work in ensemble and solos; and explore the use of scores to develop collaborative skills.

Prerequisite: Prerequisite(s): THEA 36 or by permission of the instructor.

THEA 136 - Choreography II (5)

Advanced study, exploration, and analysis of choreographic form and content. Solo, duet, and group work are created with a focus on developing the creative process, interpreting styles and trends, and knowledge of compositional devices and generative movement practices. Enrollment by permission of instructor.

THEA 137 - Studies in Performance (Dance) (5)

Studies in dance, taken in connection with performance in a major dance concert. Students are required to work on all aspects of the production. Students work with guest and faculty choreographers. May be repeated for credit with consent of instructor. Admission by audition held late winter quarter; see department office for more information.

THEA 137A - Studies in Performance (Dance): Asian (5)

Studies in Asian or Asian diasporic dance theory and practice, taken in connection with performance in a major dance concert.

Students are required to work on all aspects of the production. Students work with guest and faculty choreographers.

Prerequisite: Prerequisite(s): THEA 31A or by permission of the instructor. Concurrent enrollment in THEA 131A is required.

THEA 139 - Random: With a Purpose (5)

Participation in a student-choreographed and directed dance concert under faculty supervision. Rehearsals culminate in public performances. Auditions to be held on the first day of class.

THEA 141 - Play Direction Studio I (5)

Basic studio exploration through scene problems and exercises of the development of directing principles. Intensive work on the director's pre-rehearsal work from text selection, analysis, and casting. Audition at first class. (Formerly Future Stages.)

THEA 142 - Play Direction Studio II (5)

Intensive studio exploration of the art and craft of directing. Primary focus on text analysis, collaboration with designers, developing a point of view and visual/auditory language for the play, staging techniques, and communication techniques with actors.

Prerequisite: Prerequisite(s): THEA 40, or THEA 141, or permission of instructor.

THEA 151 - Studies in Performance (Drama) (5)

Studies in theater, taken in connection with participation in a Theater Arts Department sponsored production. Enrollment is limited to those persons chosen to take part in a particular production. Admission by audition; audition schedule to be announced at first class meeting.

THEA 151A - Studies in Performance: African American Theater Arts Troupe (5)

Studies in drama; emphasis on African American theater taken in connection with participation in a theater arts sponsored production. Enrollment by audition only, and limited to those persons chosen to take part in a particular production.

THEA 151I - Studies in Performance: Indonesian Dance and Drama (5)

Studies in drama; emphasis on Indonesian theater taken in connection with participation in a theater arts sponsored production. Enrollment by audition only, and limited to those persons chosen to take part in a particular production.

THEA 152 - Advanced Stagecraft (5)

Exploration of stage technology from the scene shop's perspective. Conversion of scenic designs to construction drawings. Pursuit of scenic-engineering and construction techniques using steel, wood, and other materials. Training on use of stage machinery: rigging, flying, wagons, tracking, and propulsion.

Prerequisite: Prerequisite(s): THEA 52.

THEA 154 - Shakespeare Santa Cruz: Writing in Response to the Bard (5)

Uses writing to respond to Shakespeare Santa Cruz's summer productions. Requires frequent assignments, such as reviews, interviews, performance notes, comparisons of productions, background pieces, and reflective essays. Students regularly revise work in response to instructor and peer feedback.

Prerequisite: Prerequisite(s): Satisfaction of the Entry Level Writing and Composition requirements.

THEA 155 - Shakespeare to Go (5)

A process-oriented investigation of Shakespeare consisting of work which may culminate in a final production. Requires a two-quarter commitment (winter and spring) with credit given in winter and touring in spring. Contact theater@ucsc.edu for details. Admission by audition at first class meeting (see department office or theater.ucsc.edu for more information). (Formerly Workshop Experiments in Performance.)

THEA 157 - Playwriting (5)

Students are given the opportunity to write their own scripts and refine them as the result of class discussion and scenework with actors. Work is on specific problems involving such elements as the structuring of a plot or the development of character.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

THEA 158 - Chautauqua Workshop (5)

Advanced course that provides directors, writers, and performers with an opportunity to develop new works in performance. Students enrolling in this course as playwrights are selected on basis of submissions turned in the previous quarter. Students taking the course as directors are required to obtain consent of the instructor. Other students may enroll as usual.

THEA 159 - Advanced Playwriting (5)

A study, through practice, of the constituent elements in the construction of a drama. Students concentrate, in particular, on the organization of complex plots, the expression of character through conflict, and maximizing the emotional impact of dramatic situations.

Prerequisite: Prerequisite(s): THEA 157 or equivalent, satisfaction of the Entry Level Writing and Composition requirements.

THEA 160 - Dramatic Theories (5)

An examination of the theories of acting and directing from the 19th century to our own time, starting with the classic theater and concentrating on the 20th-century debate centered in Stanislavski and Brecht, Grotowski, and Robert Wilson. This course must be taken prior to student's senior year; required for course 185.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

THEA 161A - Irish Theater (5)

Examines the idea of a National Theater in Ireland from its beginnings in the founding of the National Literary Society in 1892 to the current vitality of the contemporary Irish Theater.

THEA 161C - Theater and Drama of the Renaissance (5)

Examines selected plays from the Renaissance (1580-1680, Italy, Spain, England, and France) from a theatrical viewpoint. Covers Renaissance theater buildings and related critical materials. (Formerly The Theater and Drama of Renaissance Europe.)

THEA 161D - Asian Theater: An Anthropological Approach (5)

Art serves simultaneously to educate its audience to the group's traditional values and to test new ideas. Indian, Indonesian, and Japanese forms are studied in relation to their cultural context. Through videotapes, lecture demonstrations, performances, and scenework, students explore the forms.

THEA 161E - Mass Performance (5)

Explores the phenomenon of mass performance--when thousand of people perform the same thing at the same time. From political festivals, such as those of the French Revolution, to flash mobs, and covering the 19th century craze of mass gymnastics as well as Olympic opening ceremonies, the course analyzes the ideas and techniques behind mass performance. Students sharpen their critical skills in analyzing performance by working with texts, videos, live performance, and archives.

THEA 161H - Shakespeare In Asia (5)

Shakespeare takes life in Asian reinterpretations that revivify languishing genres, duck political censorship, and explore new theatrical worlds. Indian, Japanese, Chinese, and Southeast Asian Shakespeares (1868 to the present) are introduced via lecture, critical reading, videos, and scene work.

THEA 161M - Sexuality, Gender, Drama, and Performance (5)

Exploration and analysis of the interrelationships between gender, sexuality, and performance on stage and on the page. Topics include gender and homosexuality in the history of performance and dramatic literature, drag, queer Shakespeare, closet drama, same-sex performance conditions (e.g., Greece) vs. dual-gendered (e.g., Restoration England). Combines study of theoretical texts and script with analysis and practice.

THEA 161P - Theater in the Chicano Power Movement (5)

Covers the rise of Teatro Chicano as a cultural-political force within the 1960's Chicano Power Movement starting with founding playwright Luis Valdez and El Teatro Campesino and covering Chicana/o playwrights inspired by the movement, e.g. Cherrie Moraga, Luis Alfaro, and Josefina Lopez.

THEA 161Q - Queer Theatrics: Representations and Sensibilities (5)

An examination of the idea, form, and significance of queer/gay sensibility and representation in the English-speaking theater from the Renaissance to the present.

THEA 161R - Theater of American Cultures (5)

Interrelationship of ethnicity and the rise of significant American theater groups including the black theater movement, Chicano Teatro, and Asian American theater will be shared via lecture, viewing, and discussion.

THEA 161S - American Drama: Politics and Theater (5)

The dream of group theater, a long-term partnership of actors, directors, and playwrights, has fueled extraordinary and exciting change in the 20th-century American theater theory and practice. We examine ten exemplary manifestations of this dream.

THEA 161T - Women in Theater (5)

Explores female playwrights from textual, historical, and multicultural perspectives. Progresses from Trifles (1916) through the Harlem Renaissance, Broadway's Lillian Hellman, and today's post-feminist theatrical explosion in lectures, films, dramatizations, and award-winning playwrights' visits.

THEA 161U - Performance of Story in Theater and Film (5)

Examination of theory and practice of theater and film comparing and contrasting works having been adapted from one genre to another. Lecture, film, and video viewing. Discussions of materialist, psychoanalytic, and feminist approaches shared. Students cannot receive credit for this course and THEA 80X.

THEA 161X - Experimental Performance (5)

Investigates the world of experimental performance, sharpening critical skills in reading texts, videos, live performance, and archives. The focus will be on modes of performance that broke with their contemporary norms, including dance, theater, puppetry, and other gatherings.

THEA 161Y - Modern Ancient Drama (5)

Studies 20th- and 21st-century productions and adaptations of ancient Greek and Roman drama in theater, dance, music, and film, including Stravinsky, Graham, Pasolini, and Taymor. Discusses artists' goals, the sociopolitical context, ideas of authenticity and audience response.

THEA 163A - Shakespeare (5)

Focuses on selected plays of Shakespeare. Explores the range and variety of interpretations of the plays, both in critical writings and in performance. Also studies other writings and graphic art created on the subjects and themes of the plays.

THEA 163E - Chekhov and His Impact (5)

Delves into the work of Chekhov and the Moscow Art Theater. Stanislavski's acting techniques are related to the scripts through scene work. The impact on later Russian innovators, especially Meyerhold, and on the American theater is considered.

THEA 163G - Special Studies in Playwrights: Artaud (5)

Antonin Artaud through three critical lenses: influence on modern and contemporary theater, subject and site of

psychoanalytic and social criticism, and theater practitioner. Exercises cultural, historical, and analytic approaches to his work. Prerequisite: THEA 160 recommended.

THEA 163H - Henrik Ibsen and His Impact: Ghosts of the Future (5)

Examines representative texts of Ibsen's work: early plays, realistic middle plays, and late plays. The cultural/historical context of Ibsen's oeuvre is considered as well as its impact, through contemporary translations and productions, on subsequent theater theory and practice.

THEA 163K - Special Studies in Playwrights: Euripides (5)

Examines the works of the classical Athenian tragedian Euripides. The class undertakes a thorough consideration of the playwright's plays in cultural, historical, theatrical, and literary context.

Prerequisite: Prerequisite(s): THEA 61A or permission of the instructor.

THEA 164 - Issues in Dance History and Theory (5)

A research seminar. Topics range from critical dance cultures, cognitive dance studies, problems in dance aesthetics, criticism, or theory to particular movements, periods, or the work of a choreographer. Discussions may be supplemented by a movement practice component.

THEA 165 - Dance Modernism (5)

An overview of 20th-century dance within the perspective of modernism. Topics may include romanticism, natural dance, Orientalism, Ausdruckstanz, U.S. modern dance and neo-classicism, chance procedure, postmodernism, the avant-garde commodity marketplace, and critical dance cultures. Discussions may be supplemented by a movement practice component.

THEA 166 - Ballet: A History (5)

Chronological critical and historical overview of ballet as a form of ethnic dance from its European origins to the present. Focus is on development of form in Americas and Asia as it crossed with other socio-culturally constructed categories such as race, gender, class, and sexual orientation. Discussions may be supplemented by a movement practice component.

THEA 167 - Africanist Aesthetics: Live Dialogues in the Americas and Africa (5)

Examines the transnational currents in expressive culture and the performing arts among the peoples of Africa and Latin America, and Latinos and African Americans in the United States.

THEA 185 - Senior Seminar (5)

A required seminar for majors involving readings and discussions of important texts in dance, design, and drama.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; THEA 160.

THEA 190 - Group Projects (5)

Prerequisite(s): petition required, approved by instructor and department.

THEA 192 - Directed Student Teaching (5)

Teaching a lower-division seminar under faculty supervision. (See THEA 42 and THEA 45). Petition required, approved by instructor and department.

THEA 193 - Proseminar (5)

Exposes students to an aspect of the theory or practice of theater arts. Visiting scholars share their area of expertise in lectures to a small group of students.

THEA 193F - Proseminar (2)

Exposes students to an aspect of the theory or practice of theater arts. Visiting lecturers share their area of expertise in lectures to a small group of students.

THEA 198 - Independent Field Study (5)

Provides for department-sponsored individual study programs off campus for which faculty supervision is not in person (e.g., supervision is by correspondence). Students engaging in field study must complete application procedures for such study by the fifth week of the previous quarter. Petition required, approved by instructor and department.

THEA 198F - Independent Field Study (2)

Provides for department-sponsored individual study programs off campus for which faculty supervision is not in person (e.g., supervision is by correspondence). Students engaging in field study must complete application procedures for such study by the fifth week of the previous quarter. Petition required, approved by instructor and department.

THEA 199 - Tutorial (5)

Individual study in areas approved by sponsoring instructors. Students submit petition to sponsoring agency.

THEA 199F - Tutorial (2)

Individual study in areas approved by sponsoring instructors. Students submit petition to sponsoring agency.

Graduate

THEA 251 - Graduate Student Production (5)

Participation by a graduate student in a departmental production of a play, dance concert, or other performance event under supervision of the Instructor-of-Record. Rehearsals culminate in public performance. Enrollment is restricted to graduate students and determined by audition with the instructor and in consultation with the director of graduate studies.

THEA 290A - Text Analysis (5)

Presents a range of performance blueprints (texts, scores, libretti, etc.), and introduces key methodologies for translating text into performance. A final paper required.

Prerequisite: Enrollment is restricted to graduate students in theater arts.

THEA 290B - Performance Histories (5)

Contextualizes major movement in performance. Students are exposed to a wide range of historical and visual material pertinent to the creation of theater and dance. A final paper is required.

Prerequisite: Enrollment is restricted to graduate students in theater arts.

THEA 290C - Performance Analysis (5)

Examines the production approaches of a range of performance practitioners, production companies, and performance traditions. Includes exercises in analysis and reconstruction of performance. A final reconstruction project is required.

Prerequisite: Enrollment is restricted to graduate students in theater arts.

THEA 291 - Field Study (5)

Student-designed and conducted research carried out in field settings. A brief prospectus must be filed with the department office before undertaking the research, and a brief final report of activities must be filed upon return. Course intended for students with graduate standing in theater arts. Petition required, approved by instructor and department.

THEA 292 - Teaching-Related Independent Study (5)

Directed graduate research and writing coordinated with the teaching of undergraduates. Course intended for graduate students in theater arts. Petition required, approved by instructor and department.

THEA 293 - Performance Research Project (10)

Internship with a professional theater company in the student's area of emphasis. This work will have a significant academic component supervised and assessed by a theater arts faculty member during the quarter it is taken. Enrollment restricted to graduate students.

THEA 294 - Future Stages (5)

Working in an experimental theater with access to new performance technologies, course explores how cross-media practice can expand on basic theatrical relationships in new and culturally relevant ways.

Prerequisite: Enrollment is restricted to graduate students.

THEA 295 - Group Critique (5)

Peer review and constructive assessment of works in progress. Students are required to give individual presentations to the group at least once a quarter. Educational objectives are to develop the ability to articulate themes and ideas in student's body of work; to strengthen critical skills in making, evaluating, and discussing theater art; to explore the role of the audience in context and criticism; and to investigate the ways artists construct, use, and maintain support communities.

Prerequisite: Enrollment is restricted to graduate students.

THEA 297 - Independent Study (5)

Independent study or research for graduate students in theater arts. Petition required, approved by instructor and department.

THEA 297F - Independent Study/Graduate (2)

Independent study or research for graduate students in theater arts. Petition required, approved by instructor and department. Enrollment restricted to graduate students in theater arts.

THEA 299 - Capstone Thesis (5)

Involves participation in a major collaborative performance project (either faculty-directed or graduate student-directed with faculty supervision) or a research project group. Includes a written thesis, though the length will vary depending upon the student's particular emphasis.

Prerequisite: Enrollment is restricted to graduate students.

TIM-TECHNOLOGY INFORMATION MANAGEMENT

Lower-Division

TIM 50 - Business Information Systems (5)

Addresses the use of information systems (IS) within a business enterprise. Subjects include computer hardware and software concepts, system design and implementation, telecommunications, data management, transaction-based systems, management information systems, and the use of IS to compete. Intended for technology and information management and business management economics majors. (Formerly CSE 50.)

TIM 58 - Systems Analysis and Design (5)

Students learn how information technology is used to deal with business requirements and/or solve business problems. Provides an understanding of structured computer systems analysis and design methodologies and techniques and their application to business information systems. Intended for technology and information management and business management economics majors. (Formerly CSE 58.)

Prerequisite: Prerequisite(s): TIM 50.

TIM 80C - Starting a New Technology Company (5)

Focuses on the creation and management of technology start-ups and small companies, using case studies and team projects as the basis for learning and applying the course materials. (Formerly CSE 80C.)

Upper-Division

TIM 170 - Management of Technology Seminar (2)

Uses weekly talks by leading industry practitioners and university researchers to provide in-depth exposure to the management of technology. Topics covered include product

development, operations, strategy, finance, and marketing for technologies such as software and information systems. (Formerly CSE 170.)

TIM 172A - Introduction to Management of Technology I (5)

Addresses strategic, engineering, marketing, and financial processes and tools for the management, development, and commercialization of high-tech products. Declared TIM majors must concurrently enroll in TIM 172P to fulfill the capstone series. (Formerly CSE 171A.)

Prerequisite: Prerequisite(s): MATH 19B or MATH 11B or AM 11B or ECON 11B.

TIM 172B - Introduction to Management of Technology II (5)

Addresses the development and application of processes and tools for the management, design, optimization, and operation of supply chain networks for high-tech products. Declared TIM majors must concurrently enroll in TIM 172Q to fulfill the capstone series. (Formerly CSE 171B.)

Prerequisite: Prerequisite(s): TIM 172A.

TIM 172P - Management of Technology Project I (3)

First of a two-course project sequence in which students apply the knowledge and skills gained in TIM 172A to complete the first part of a major quarter-long comprehensive team project in the management of technology. In this course, taken concurrently with TIM 172A, the team project focus is on the management, design, and commercialization of a new product within a high-tech company. TIM 172A and TIM 172P together form the first part of the required management of technology comprehensive requirement for the TIM B.S. major.

Prerequisite: Prerequisite(s): concurrent enrollment in TIM 172A. Enrollment is restricted to senior Technology and Information (TIM) majors. Junior TIM majors may enroll by permission of instructor.

TIM 172Q - Management of Technology Project II (3)

Second of a two-course project sequence in which students apply the knowledge and skills gained in TIM 172B to complete the second part of a major comprehensive team project in the management of technology. In this course, taken concurrently with TIM 172B, the team project focus is on the supply chain management for the new product developed in TIM 172P. TIM 172B and TIM 172Q together form the second part of the required management of technology comprehensive requirement for the TIM B.S. major.

Prerequisite: Prerequisite(s): TIM 172A and TIM 172P. Concurrent enrollment in TIM 172B is required.

TIM 173 - Financial Engineering and Management in High Technology Firms (5)

Addresses methods and tools for financing technology development and projects. Includes approaches for coordinating finance and accounting with strategy and operations of firms; discounted cash-flow analysis; activity-based costing; financial

planning; and elements of financial account and investment science. (CSE 173.)

Prerequisite: Prerequisite(s): ECON 113 or STAT 131 or CSE 107 or by instructor permission.

TIM 175 - Business Strategy and Information Systems (5)

Analysis of effective use of information systems within a business enterprise, with emphasis on gaining a competitive advantage. Integration of information systems with business strategy, financial justification, personnel, and organizational considerations are highlighted. Intended for technology and information management majors or senior engineering majors who have a business interest. (Formerly CSE 175.)

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; and TIM 50 or permission of instructor.

TIM 193 - Field Study (5)

Provides individual programs of study with specific academic objectives carried out under direction of faculty member of Technology and Information Management and a willing sponsor at field site. Uses resources not normally available on campus. Credit based on presentation of evidence of achieving objectives by submitting written and oral presentation. Students submit petition to sponsoring agency.

TIM 193F - Field Study (2)

Provides individual programs of study with specific academic objectives carried out under direction of faculty member of Technology and Information Management and a willing sponsor at field site. Uses resources not normally available on campus. Credit based on presentation of evidence of achieving objectives by submitting written and oral presentation. Cannot normally be repeated for credit. Students submit petition to sponsoring agency.

TIM 194 - Group Tutorial (5)

A program of independent study arranged between a group of students and a faculty member. Students submit petition to sponsoring agency.

TIM 194F - Group Tutorial (2)

A program of independent study arranged between a group of students and a faculty member. Students submit petition to sponsoring agency.

TIM 195 - Senior Thesis Research (5)

Intended for majors. Students submit petition to sponsoring agency.

TIM 195F - Senior Thesis Research (2)

Intended for majors. Students submit petition to sponsoring agency.

TIM 198 - Individual Study or Research (5)

Intended for majors. Students submit petition to sponsoring agency.

TIM 198F - Individual Study or Research (2)

Intended for majors. Students submit petition to sponsoring agency.

TIM 199 - Individual Study or Research (5)

Individual directed study for upper-division undergraduates. Enrollment is restricted to senior technology and information management majors. Students submit petition to sponsoring agency.

UCDC - UCDC**Upper-Division****UCDC 100 - UCDC Prep (Remote) (1)**

Prepares and orients students to participate in UCDC the next quarter. Guides them through all the required steps needed to search out internships of interest, prepare application materials, hone interview skills, choose and be prepared for UCDC courses, and get the most out of their internships. Also informs students about the support services and other programming the UCDC program offers to ensure successful experiences in the program. Enrollment is by permission and is restricted to students accepted into the UCDC program for the following term. This course can be taken for Pass/No Pass grading only.

UCDC 194A - UCDC Internship Research Seminar (5)

Weekly seminar that focuses on the production of a major research paper or equivalent scholarly undertaking connected to an internship in Washington, D.C., government, non-profit, or private institution. Seminar stresses institutional analysis, the development of bibliographic expertise in the use of Washington-based resources, and participant-observer skills. Required for and enrollment is restricted to students participating in the UCDC Program.

UCDC 194B - UCDC Internship (7)

A 30- to 36-hour-per-week internship in a Washington, D.C., government, non-profit, or private institution. Required for and enrollment is restricted to UCDC program participants.

UCDC 199 - Tutorial (5)

A program of directed study arranged with a Social Sciences Division faculty member. Enrollment is restricted to participants in the UCDC program.

UCDC 199F - Tutorial (2)

A program of directed study arranged with participating faculty. Class time is proportionally less than a 5-credit course. Enrollment is restricted to participants in the UCDC program.

WRIT - WRITING**Lower-Division****WRIT 1 - Introduction to Composition (5)**

Provides declarative knowledge and procedural knowledge about writing, with a special focus on genre, rhetorical situation, revision, editing, and making connections between texts and one's own perspective.

Prerequisite: Prerequisite(s): College 1 and WRIT 26; or College 1 and AWPE score of 2-6 or AWPE for Multilingual Students (AWPE-MLS) score of 6; or College 1 and course selection via Directed Self-Placement.

WRIT 1E - Introduction to Composition (5)

Provides declarative knowledge and procedural knowledge about writing, with a special focus on genre, rhetorical situation, revision, editing, and making connections between texts and one's own perspective. Designed to support multilingual learners.

Prerequisite: Prerequisite(s): College 1 and WRIT 26; or College 1 and AWPE score of 2-6 or AWPE for Multilingual Students (AWPE-MLS) score of 6; or College 1 and course selection via Directed Self-Placement.

WRIT 2 - Rhetoric and Inquiry (5)

Provides declarative knowledge about writing, with a special focus on writing from research, composing in multiple genres, and transferring knowledge about writing to new contexts.

Prerequisite: Prerequisite(s): College 1 and satisfaction of the Entry Level Writing; or College 80A, 80D, or 80F and satisfaction of the C1 requirement. Enrollment is restricted to frosh, sophomore and junior students.

WRIT 2H - Rhetoric and Inquiry, Honors (5)

Provides declarative knowledge and procedural knowledge about writing, with a special focus on writing from research, composing in multiple genres, and transferring knowledge about writing to new contexts. Designed for advanced students.

Prerequisite: Prerequisite(s): College 1 and satisfaction of the Entry Level Writing Requirement. Enrollment is restricted to College Scholars or students with an AWPE score of 10-12 or equivalent.

WRIT 11A - Adjunct Tutorial in Writing (2 credits per quarter) (2)

A tutorial designed to provide follow-up assistance in writing for students who have passed the Entry Level Writing Requirement, but wish to continue to work on various aspects of their writing. Counts only for academic standing and financial aid purposes, but does not apply toward degree requirements (i.e., counts as workload credit only). Prerequisite(s): approval of the Writing Program; satisfaction of the Entry Level Writing Requirement.

WRIT 11B - Adjunct Tutorial in Writing (2 credits per quarter)

(2)

A tutorial designed to provide follow-up assistance in writing for students who have passed the Entry Level Writing Requirement, but wish to continue to work on various aspects of their writing. Counts only for academic standing and financial aid purposes, but does not apply toward degree requirements (i.e., counts as workload credit only). Prerequisite(s): approval of the Writing Program; satisfaction of the Entry Level Writing Requirement.

WRIT 11C - Adjunct Tutorial in Writing (2 credits per quarter) (2)

A tutorial designed to provide follow-up assistance in writing for students who have passed the Entry Level Writing Requirement, but wish to continue to work on various aspects of their writing. Counts only for academic standing and financial aid purposes, but does not apply toward degree requirements (i.e., counts as workload credit only). Prerequisite(s): approval of the Writing Program; satisfaction of the Entry Level Writing Requirement.

WRIT 23 - Grammar and Rhetoric: Language for Writing (5)

Builds on writing skills gained in previous writing courses; focuses on effective language use in academic writing. Students reinforce their written English proficiency by reading, studying, practicing, and writing structures and patterns of written English.

Prerequisite: Enrollment is restricted to fourth-quarter students who have not passed the Entry Level Writing Requirement. Open to others by permission of instructor.

WRIT 25 - Writing About Place (5)

Students explore the UCSC discourse community including classroom culture, then widen their lens to include the larger Santa Cruz community. Writing moves beyond the paragraph level to include oral communication and presentation skills.

Prerequisite: Prerequisite(s): AWPE-MLS score of 2 or 3; or course selection via Directed Self-Placement.

WRIT 26 - Writing About Language (5)

Students explore language acquisition and how to best optimize their own language learning by engaging in a primary research project. Through the research project, students learn to use academic discourse conventions in their own writing.

Prerequisite: Prerequisite(s): WRIT 25, AWPE-MLS score of 4 or 5, or course selection via Directed Self-Placement.

WRIT 30 - Genre Study: STEM (2)

Engages students in an examination of the textual practices and products (genres) through which knowledge in science, technology, engineering, and mathematics (STEM) fields is created, documented, and disseminated. Enrollment is by interview only and restricted to Summer Academy, first-year participants.

WRIT 64 - Newswriting Workshop (5)

Introduction to the basic techniques of newswriting, including practice in leads, formats, and different kinds of news reporting. Emphasis on developing skills in research, interviewing, and shaping stories. Includes an examination of the contemporary media. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, instructor determination at first class meeting.

WRIT 70 - Communication and Rhetoric: An Introduction (5)

This course introduces the field of contemporary communication studies, locating its roots in rhetoric and showing how key concepts play out in mass media and other settings as well as in everyday life.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing requirement.

WRIT 93 - Field Study (5)

For lower-division students: supervised study within commuting distance of campus. May include internships at magazines, newspapers, publishing houses, or newsletters of corporations, and civic or service organizations. Prerequisite(s): satisfaction of the Entry Level Writing requirement; certification of adequate preparation; approval of Writing Program.

WRIT 93F - Field Study (2)

For lower-division students: supervised study within commuting distance of campus. May include internships at magazines, newspapers, publishing houses, or newsletters of corporations, and civic or service organizations. Students submit petition to sponsoring agency.

WRIT 99 - Tutorial (5)

Individual, directed study for lower-division students in expository writing, editing, or journalism. Students submit petition to sponsoring agency.

WRIT 99F - Tutorial (2)

Individual, directed study for lower-division students in expository writing, editing, or journalism. Students submit petition to sponsoring agency.

Upper-Division

WRIT 101 - Introduction to the History, Theory, and Practice of Rhetoric (5)

A survey of classical and contemporary ideas about rhetoric which explores, practically and theoretically, the best means of persuasion in any situation whatsoever and will consider the nature of human discourse in diverse areas of knowledge.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

WRIT 102 - The Rhetoric of the Social Sciences (5)

Develops rhetorical facility in disciplinary writing for upper-division social science majors. Requires critical and disciplinary reading, writing in modes appropriate to social science disciplines, and a substantial research or critical paper within the student's own discipline.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

WRIT 104 - Writing in the Arts (5)

A writing course focusing on the purposes and composition of various genres of writing about and in the performing arts, visual arts, and music such as reviews, program and exhibit notes, journal and magazine articles, grant proposals, and press releases.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

WRIT 106 - Public Speaking (5)

Students learn strategies to write, analyze, and deliver effective speeches of various kinds as well as professional presentations using PowerPoint and other visuals.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

WRIT 107 - Technical and Business Writing: An Overview (5)

An exploration of the conventions and formats of business and technical writing. Coursework involves writing effective resumes, proposals, letters, end-user manuals, and the fundamentals of Web site design.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

WRIT 108 - Electronic Communication (5)

An introduction to the evolving conventions of effective Web site design as well as collaborative writing. Coursework includes evaluation of Web site content and structure and creation of hypertext.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

WRIT 109 - Argument and Practical Reasoning (5)

An investigation of contemporary persuasive discourse with special attention to the elements and forms of argument, the nature of evidence, questions of validity and probability, and the workings of rhetorical reasoning. Emphasizes the analysis of arguments rather than their construction.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

WRIT 110A - Writing in the Professions (5)

Study of writing required in the selected professions, including law, politics, and government. Considers the rhetoric of each discipline and relevant texts. Includes lectures from visiting

professionals and a series of writing assignments based on reading and research. Topic may vary from year to year, focusing on the rhetoric of other professional divisions: medicine, engineering, economics, and so forth.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

WRIT 120 - Editing English Prose (5)

This course offers extended, detailed instruction in editing one's own and other people's prose for accuracy, clarity, appropriateness, and effectiveness. It provides some history of theories of style and stylistic analysis, and instruction in prose variation according to social context.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

WRIT 159 - Grammar for Tutors and Teachers (3)

English grammar from a pedagogical perspective, emphasizing structures, patterns, and conventions of written English that commonly challenge basic writers. Students learn strategies for helping multilingual and other writers improve their writing skills by increasing their awareness of grammar.

Prerequisite: Prerequisite(s): WRIT 169, or by instructor permission.

WRIT 161 - Academic Writing and Research Methods (5)

Introduces library and field research methods and also provides instruction and practice in writing from research, addressing issues such as voice, argument, and documentation. Students write four lengthy essays and do considerable informal writing. WRIT 161 includes sections for re-entry women, transfer students, and students in the EOP Faculty Mentor Program. Prerequisite(s): satisfaction of Entry Level Writing and Composition requirements. Students should contact the instructor for enrollment information.

WRIT 163 - Advanced Workshop in Expository Writing (5)

A composition course for students who, having mastered basic writing skills, wish to concentrate on increasing their effectiveness as rhetoricians, prose stylists, and editors. Assignments include writing and revising essays, responding to other students' work, and reading published essays.

Prerequisite: Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements.

WRIT 166D - Minorities in Journalism (5)

Focuses on the minority press and how it has shaped journalism in the U.S. as well as viewing how the media has dealt with this segment of our society. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements and consent of instructor.

WRIT 166J - Online Journalism (5)

A course in using electronic sources to report articles for publication and in publishing journalistic pieces online.

Prerequisite(s): WRIT 64 or journalism experience; instructor determination at first class meeting.

WRIT 166N - The Rhetoric of Radio (5)

Examines the theory and practice of radio. Students explore how the formats of radio create its meaning, and investigate radio's place in the landscape of the media, particularly in the U.S. and Mexico. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements and consent of instructor.

WRIT 169 - Theory and Practice of Tutoring Writing (3)

An introduction to theory and research on the composing process and practical strategies for teaching writing, especially in tutorial situations. Recommended for writing assistants. Prerequisite(s): C requirement and enrollment by permission of the instructor

WRIT 180 - Seminar in Editing and Publishing (5)

Newsriting seminar for *City on a Hill* editors and writers. Weekly sessions evaluate newspaper in depth, including writing, reporting, and issues in journalism ranging from ethics to legal questions. Prerequisite(s): instructor determination at first class meeting; open only to editors, interns, and writers at City on a Hill Press.

WRIT 189 - Methods of Teaching Writing (5)

Supervised by a writing instructor, each student attends a weekly seminar on teaching writing and either assists in a class or serves as a facilitator of a small writing group in a course at UCSC or a public school. Students submit petition to sponsoring agency.

WRIT 191A - Internship in Writing (5)

Regular writing for newspaper or magazine. Students submit petition to sponsoring agency.

WRIT 191B - Internship in Editing (5)

Work in an editorial position involving critique and guidance of reporters. Students submit petition to sponsoring agency.

WRIT 191C - Internship in Publishing (5)

All phases of work for a publishing house, from manuscript reading to editorial. Students submit petition to sponsoring agency.

WRIT 191D - Internship in Broadcasting (5)

Writing, editing, scheduling, and/or broadcast work for television or radio. Students submit petition to sponsoring agency.

WRIT 192 - Directed Student Teaching (5)

Teaching of a lower-division seminar under faculty supervision. (See WRIT 42.) Students submit petition to sponsoring agency.

WRIT 193 - Field Study (5)

For upper-division students: supervised study within commuting distance of the campus. May include internships at magazines, newspapers, publishing houses, or newsletters of corporations, and civic or service organizations. Prerequisite(s): satisfaction of Entry Level Writing requirement; students submit petition to sponsoring agency.

WRIT 193F - Field Study (2)

For upper-division students: supervised study within commuting distance of the campus. May include internships at magazines, newspapers, publishing houses, or newsletters of corporations, and civic or service organizations. Students submit petition to sponsoring agency.

WRIT 194 - Group Tutorial (5)

A writing, editing, or publishing project undertaken by a small group of students under the direct supervision of a writing instructor. Students submit petition to sponsoring agency.

WRIT 195 - Senior Thesis (5)

Individual work on a thesis for any campus major or individual major. Faculty in the Writing Program help students on all phases of work, from selection and focus to development of bibliographies, research techniques, revision, and editing. Students submit petition to sponsoring agency.

WRIT 196 - Developing and Editing Field Documentation (2)

Helps students transform field documentation into fully developed, professional projects. Employs a weekly production schedule and teaches principles of rhetoric as a means of effectively selecting and arranging documentary materials. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; interview with instructor to review documentary materials.

WRIT 198 - Independent Field Study (5)

Individual study for which faculty supervision is possible only by correspondence. May include internships at newspapers, magazines, publishing houses, or the newsletters of corporations, and civic or service organizations. Prerequisite(s): satisfaction of Entry Level Writing requirement; students submit petition to sponsoring agency.

WRIT 198F - Independent Field Study (2)

Individual study for which faculty supervision is possible only by correspondence. May include internships at newspapers, magazines, publishing houses, or the newsletters of corporations, and civic or service organizations. Students submit petition to sponsoring agency.

WRIT 199 - Tutorial (5)

Individual, directed study for upper-division students in expository writing, editing, or journalism. Students submit petition to sponsoring agency.

WRIT 199F - Tutorial (2)

Individual, directed study for upper-division students in expository writing, editing, or journalism. Students submit petition to sponsoring agency.

Graduate**WRIT 202 - Writing and Learning Seminar (3)**

Strategies for teaching assistants to help undergraduates become better learners and writers in disciplinary courses. Topics include using writing to improve reading and thinking, analysis of assignments, avoiding plagiarism, responding to and evaluating papers, ESL writers, peer response, and technological aids.

Prerequisite: Enrollment is restricted to graduate students.

WRIT 203 - Teaching Writing (5)

Prepares graduate students to teach first-year composition at UCSC and elsewhere. Development of a syllabus, teaching strategy, and class plans based on study of composition and rhetorical theories, research on students' writing development, and effective writing pedagogies.

Prerequisite: Enrollment is restricted to graduate students.

YIDD - YIDDISH**Lower-Division****YIDD 1 - First-Year Yiddish (5)**

Introduces the Yiddish language. Students learn to speak and to ask others in Yiddish about themselves and about common situations (the classroom, work, family), and learn to read and write simple Yiddish texts.

YIDD 2 - First-Year Yiddish (5)

Follows YIDD 1, expanding vocabulary to include the weather, physical health and sickness, holidays, clothing, etc., and increasing student ability for self-expression using different tenses and grammatical cases.

Prerequisite: Prerequisite(s): YIDD 1 or by consent of instructor.

YIDD 3 - First-Year Yiddish (5)

Follows YIDD 2, expanding vocabulary to include food, travel, and academic life, with an emphasis on the expression of feelings and opinions, agreement and disagreement, making use of all tenses and all grammatical cases.

Prerequisite: Prerequisite(s): YIDD 2 or by permission of the instructor.

YIDD 99F - Tutorial (2)

Students submit petition to sponsoring agency.

UNDERGRADUATE INFORMATION

In this section:

Undergraduate Admission (p. 1187)

Undergraduate Expenses (p. 1192)

Undergraduate Academic Program (p. 1197)

The Colleges and Student Life (p. 1221)

UNDERGRADUATE ADMISSION

In this section:

Admission Procedures (p. 1187)

Admission as a Transfer Student (p. 1189)

Admission of U.S. Students from Outside California (p. 1190)

Admission of International Students (p. 1190)

Readmission (p. 1190)

Admission to Special Categories (p. 1191)

Nondiscrimination, Harassment, and Affirmative Action Policies (p. 1191)

Undergraduate admission to the University of California is based on multiple academic factors, as well as on personal achievements. The university has minimum admission qualifications, which are the same for each of the UC campuses, but when the number of minimally qualified applicants exceeds a campus's capacity for admission, additional faculty-approved selection criteria are applied.

If you are considering applying to UC Santa Cruz, the Office of Undergraduate Admissions wants to help you learn more about the campus, its distinctive educational programs, and its selection process for both first-year and transfer applicants. For more information, see Undergraduate Admissions.

The University of California, Santa Cruz encourages applications from a diverse range of students, including applicants coming from low socioeconomic backgrounds, first-generation students, students with disabilities, current members of the military, military veterans, and non-traditionally aged students. In addition, the campus welcomes students from throughout the U.S. and the world.

Admission by Exception. Admission by Exception is granted to a very small percentage of applicants who do not meet UC requirements. Such factors as academic accomplishments in light of a person's life experiences and/or special circumstances, socioeconomic background, special talents and/or achievements, contributions to the community, and the applicant's answers to the Personal Insight Questions are taken into consideration.

Campus Safety. UC Santa Cruz campus crime statistics can be viewed in the annual Clery Report, available at the UC Santa Cruz Police Department website.

Graduation rates. The following graduation-rate information is listed in compliance with the 1990 Title I: Federal Right-to-Know Act, Section 103. Fifty-two percent of the students who entered as first-year students in 2013 graduated in four years; 71 percent of those who entered in 2012 graduated in five years; and 77 percent of those who entered in 2011 graduated in six years. These graduation rates are well above the national averages. Among the most recent entering cohorts, those who entered as first-year students took an average of 4.4 years to graduate, and students transferring to UCSC as juniors averaged 2.5 years.

In accord with the Education Amendments of 1976, Section 493A, more detailed information regarding retention is available at the Institutional Research website.

Admission Procedure

The University of California Application for Undergraduate Admission and Scholarships becomes available beginning August 1 for the following academic year. Students may access applications online.

In addition, the Undergraduate Admissions website includes a wealth of information for prospective UC Santa Cruz students about undergraduate education, admission, financial aid, and various topics of interest.

APPLICATION FILING PERIODS

Applications for the fall quarter must be submitted during the month of November and applications for winter quarter admission are accepted only for junior transfer students in certain majors. Check the Office of Undergraduate Admissions in mid-June to see details on winter quarter admission. UCSC does not accept applications for spring quarter admission.

APPLICATION FEES

The application fee is \$70 (\$80 for international nonimmigrant applicants) to apply to one campus of the University of California. For each additional campus you select, you must pay an extra \$70 fee (\$80 for international nonimmigrant applicants). These fees are subject to change and are not refundable. The online application includes payment instructions.

FEE WAIVERS

The University of California will waive application fees for up to four campuses for certain students who otherwise would be unable to apply for admission. To qualify for the fee waiver, you must meet specific requirements related to your family income and size. The fee waiver is for U.S. citizens and

permanent residents only. We encourage students who qualify for a fee waiver to take full advantage of the fee waiver by applying to the maximum of four UC campuses.

Students who qualify for fee waivers and who select more than four campuses must pay \$70 for each additional choice. Methods of obtaining fee waivers are listed below.

An online fee waiver form is available to applicants when they apply. The application automatically determines if you are eligible for the fee waiver as soon as it is complete.

High school students: Use the College Board fee waiver. It is available from your school counselor.

EOPS community college students: If you are enrolled in Extended Opportunity Programs and Services (EOPS) at a California community college, obtain a fee waiver authorization from the EOPS Office.

ADMISSION AS A FIRST-YEAR STUDENT (FRESHMAN)

The university considers you a freshman applicant if you have graduated from high school and have not enrolled in a regular session at any college or university. If you attend a summer session immediately after graduating from high school, you are still a freshman applicant.

The admission and selection process to UC Santa Cruz reflects the academic rigor and preparation needed for admission to a major research institution. Meeting the minimum qualifications for the university does not guarantee you admission as a freshman. Students are encouraged to achieve well beyond the minimum qualifications to enhance their chances for selection.

UC Santa Cruz uses a holistic approach in selecting freshmen for admission. Applicants are thoroughly reviewed to determine the full spectrum of their academic and personal achievements, viewed in the context of their academic and personal opportunities. UCSC uses 13 faculty-approved criteria to determine an individualized, single score for each applicant.

Information regarding the admission and selection process for UC Santa Cruz can be accessed on the Undergraduate Admissions website. This site provides information on the minimum qualifications for the University of California for both residents and nonresidents of California, including international students (see also Admission of Students from Outside California and Admission of International Students).

HIGH SCHOOL PREPARATION FOR UNIVERSITY WORK

Carefully planned high school coursework provides you with the best preparation for your undergraduate university studies, and allows for advanced preparation for your chosen field of study. Most important, students who master certain basic knowledge and skills in high school substantially increase their chances of success at the university. (Requirements for transfer students are explained in the Admission as a Transfer Student section.)

The basic foundation of UC qualifications is the completion of college preparatory courses required for admission (see “a–g” Subject Requirements below). However, you should take courses beyond the minimum levels in reading, writing, and mathematics in order to be adequately prepared for basic university courses that you may be expected to take freshman year.

A well-prepared student will have mastered the equivalent of four years of English composition and literature with a focus on expository writing; four years of mathematics, including a precalculus course in the senior year; two to three years of a language other than English; two to three years of laboratory science; two or more years of history and social sciences; and one or more years of visual or performing arts.

You should also give careful thought to the general field of study, and perhaps the specific major, you want to pursue at the university. By making this decision in advance, you can plan to take additional courses in high school related to the field.

SUBJECT REQUIREMENTS

The “a–g” subject requirements are described in detail on the Admissions website.

1. History/social science—two years required.
2. English—four years required.
3. Mathematics—three years required, four years recommended.
4. Laboratory science—two years required, three years recommended.
5. Language other than English—two years required, three years recommended.
6. Visual and performing arts discipline (VPA)—one year required.
7. College preparatory electives—one year required.

Senior-Year (12th-Grade) Program. The senior year should be used to prepare you for your first year at the university and should include honors and advanced courses, as well as courses that will strengthen overall preparation. A challenging, successfully completed senior-year program is a natural bridge between high school and university coursework in the intended major. A strong senior program is one of the selection criteria used at UC Santa Cruz.

HIGH SCHOOL PROFICIENCY EXAMINATION

While the University of California expects all freshman applicants to have graduated from high school/secondary school, in lieu of the regular high school diploma (or its equivalent), the university will accept the following:

- Certificate of Proficiency, awarded by the State Board of Education upon successful completion of the California High School
- General Educational Development (GED) Certificate
- Proficiency tests from other states and other countries

TRANSFER CREDIT

Transfer credit may be granted to a freshman applicant for acceptable college courses taken while still in high school if an official transcript is received from the college where the coursework was completed.

Transfer credit is granted for specified College Board Advanced Placement Examinations completed with a score of 3, 4, or 5 and for specified International Baccalaureate Higher Level Exams completed with a score of 5, 6, or 7. A score of 30 or higher on the International Baccalaureate Diploma is also awarded transfer credit.

Transfer credit is granted for specified GCE and Hong Kong A-Level Examinations.

Students should be advised that college courses taken before or after attending UCSC may duplicate AP, IB, and/or A-Level Examinations. Additionally, exams may duplicate each other (for example, an AP or IB exam in the same subject area). If the student does duplicate an exam with another exam of the same subject content, and/or an exam with a college course, UCSC awards credit only once.

Admission as a Transfer Student

The University of California defines a transfer applicant as a student who has been a registered student in a college or university, or in college-level extension classes following high school graduation. Summer session attended immediately following high school graduation is excluded in this determination. If you are a transfer applicant, you cannot disregard your college record and apply for admission as a freshman.

The admission and selection process for transfers to UC Santa Cruz reflects the academic rigor and preparation needed for admission to a major research institution. Meeting the minimum qualifications for the university does not guarantee you admission as a transfer student. It is expected that students will have completed the lower-division courses required by their intended major prior to transfer. See Screening Major Selection Criteria for an annual listing of all majors that require specific courses/grades prior to transfer to UCSC.

Transfer applicants are thoroughly reviewed to determine their full spectrum of academic and personal achievements, including transfer coursework completed for their intended major. UCSC uses faculty-approved criteria to determine which transfer students will be selected for admission. UC Santa Cruz gives the highest priority to junior-level transfer students coming from California community colleges.

Information regarding the admission and selection process for UC Santa Cruz can be accessed at the Undergraduate Admissions website. This site provides information on the minimum qualifications for the University of California for students in California, in other states, and outside the U.S.

UC SANTA CRUZ TRANSFER ADMISSION GUARANTEE (TAG) PROGRAM

UC Santa Cruz's TAG (Transfer Admission Guarantee) Program is designed for California community college transfer students at the junior level. The benefits of participating in UCSC TAG include informational mailings, and invitations to events. All California community colleges participate in the UC Santa Cruz TAG program.

The UC TAG application must be submitted online between September 1 and September 30 for the following fall quarter. UCSC accepts transfer admission agreements for fall quarter only.

Further information may be found at Transfer Admission Guarantee (TAG) Program.

UC TRANSFER ADMISSION PLANNER (TAP)

The UC Transfer Admission Planner is an online tool designed to help prospective UC students transferring from California community colleges track and plan their coursework, including those students who are seeking a Transfer Admission Guarantee (TAG) with one of the seven participating UC campuses.

Further information may be found at UC Transfer Admission Planner.

CREDIT FOR COURSES TAKEN ELSEWHERE

The university gives unit credit to transfer students for courses they have completed at other accredited colleges and universities, including courses taken at recognized institutions outside of the U.S. To be accepted for credit, your courses must be comparable to those offered at the university, as determined by the UC Santa Cruz Undergraduate Admissions Office. The UC Santa Cruz department sponsoring your major decides which transfer courses may be used to satisfy major requirements.

A total of 70 semester units (105 quarter units) of lower-division credit toward a university degree may be earned at other colleges/universities. Only subject credit will be granted for courses taken in excess of that cap. Please note that credit from another University of California campus is exempt from this limitation.

Applicants will not be considered for admission if they have completed 90 semester units (135 quarter units) or more of UC-transferable upper-division and lower-division combined credit.

If students have earned all of their credits as lower-division credits, they are not affected by this limit. All coursework completed at California community colleges is considered lower division. Advanced Placement (AP) or International Baccalaureate Higher Level (IBH) credit is permitted to exceed the 90-semester unit maximum by the number of AP or IBH units granted.

Opportunities to take courses at UC Santa Cruz as a nonmatriculated student are available through Summer Session, Open Campus/Concurrent Enrollment through UC Extension, and Intersegmental Cross-Enrollment.

UC SANTA CRUZ TRANSFER SERVICES

The Office of Undergraduate Admissions provides information to all students who wish to transfer to UC Santa Cruz. For prospective transfer students and their families, Undergraduate Admissions offers Transfer Information Sessions. Transfer Information Sessions are small-group meetings in which an adviser presents information about transfer admissions and transfer-related student services. Please note that pre-evaluations of transcripts are not available as part of the sessions. These sessions are designed for students who have not yet applied to UCSC. Students and their families may make reservations at the Transfer Information Sessions web page.

Student-led guided tours take place year-round and also require advance reservations. Please see Undergraduate Admissions website to make a reservation. **Note: Due to modified operations because of COVID-19, tours are currently unavailable until further notice.**

In addition, UC Santa Cruz Admissions counselors visit many community colleges in California. Check with your counseling department or transfer center to determine whether a UCSC counselor will be visiting your community college.

UC SANTA CRUZ OFFICE OF ADMISSIONS TRANSFER PREPARATION PROGRAM (TPP)

The UC Santa Cruz Transfer Preparation Program (TPP) supports prospective transfer students from California community colleges and assists them in enrolling at UC Santa Cruz, as well as at other campuses. TPP Admissions representatives work most closely with students who are attending one of the 13 community colleges in the region to plan a successful transfer program, but will assist any California community college student who has questions.

The Transfer Preparation Program also collaborates with programs and initiatives that strengthen the transfer process and support individual students in making a successful transition to a four-year institution.

Further information may be found at Transfer Preparation Program web page.

Admission of U.S. Students from Outside

California

UC Santa Cruz welcomes students from across the U.S. to enhance our vibrant campus community. Out-of-state applicants must meet the same admission qualifications as California students, but with a higher GPA. Detailed information for UC Santa Cruz is provided at our Out-of-State Students website. Information for all 10 general campuses of the University of California can be viewed at University of California Admissions.

Students who are not California residents are assessed nonresident tuition in addition to educational and registration fees. Residency for fee purposes is determined after admission based on documentation provided in a Statement of Legal Residency. See California Residence for Tuition Purposes.

Admission of International Students

The University of California welcomes students from countries throughout the world to enhance our vibrant campus community. The academic credentials of applicants from other countries are evaluated by Admissions specialists in accordance with UC faculty-approved regulations governing admission.

UC Santa Cruz accepts applications from international students for the fall quarter, and students should begin application inquiries a year before the quarter of desired admission. Openings for the winter quarter may be limited. If you are interested in applying for winter, check with the Office of Undergraduate Admissions.

If your native language is not English, you must certify proficiency in English. Further information is available on the Office of Undergraduate Admissions website.

A financial certificate and official academic records will be required if you are admitted to the university. Generally, nonimmigrant students must provide documentation that sufficient funds will be available to cover nonresident tuition, educational fees, and living expenses. The university does not offer need-based financial assistance to international students.

For information about services for international students, see the International Student & Scholar Services website.

Readmission

If you are an undergraduate who wants to return to UC Santa Cruz after an absence of a portion of a quarter or more, you must file an Application for Readmission. The application form is available online at the colleges readmission website. The completed application should be filed with the Office of Undergraduate Admissions during the appropriate period:

Quarter of Attendance	Application Filing Period
Fall quarter	January 1–March 31 (by *May 31 for late applications)
Winter quarter	July 1–September 30
Spring Quarter	October 1–December 31

* Approval during the extended filing period is subject to the discretion of the college. *Applicants filing for fall readmission during the extended filing period between April 1 and May 31 may not be approved. Those that are approved will have a late enrollment appointment. Class selection and availability may be limited. To ensure timely processing and enrollment opportunities, we strongly recommend all fall readmission applications be filed by March 31.*

There is a \$70 filing fee, which is nonrefundable and nontransferable. The filing fee will be billed to your student account; you are responsible for this fee even if you do not return to UCSC.

If during your absence you attended another UC campus, an official transcript must be submitted to the Office of Undergraduate Admissions before your application will be sent to your college for approval. If you attended another collegiate institution, your UC Santa Cruz college may require a transcript. If you left for health reasons, clearance from the Cowell Student Health Center is required. You must pay all outstanding bills owed to the university before you will be permitted to register.

Admission to Special Categories

Admission to either of the categories described below is at the sole discretion of UC Santa Cruz, and only when enrollment allows. Students seeking their first undergraduate degrees have priority over students who have already earned an undergraduate degree. For information on applying for admission in the categories described below, please contact the Office of Undergraduate Admissions.

SECOND BACHELOR'S DEGREE

If your educational goals have changed substantially since receiving your bachelor's degree, you may be eligible to pursue a second undergraduate degree at UC Santa Cruz. Applications from students interested in pursuing a second baccalaureate program will be considered as campus enrollment allows. Priority is given to applicants who have not yet had the opportunity to complete a bachelor's degree.

You must meet regular university admission qualifications, and your experience or previous scholarship record must show potential for academic success in your proposed area of study. Additional selection criteria will be applied, and admission is subject to approval by the appropriate department.

For a second degree, you must fulfill major and residence requirements, as well as UC systemwide requirements in American History and Institutions and the Entry Level Writing Requirement. You must enroll for at least three quarters and are usually restricted to six quarters total.

LIMITED STATUS

If you have already completed an undergraduate degree and you have a particular reason to take specific undergraduate university classes, you may be eligible to enroll in a non-degree program as a limited-status student. Applications from students interested in limited-status enrollment are permitted as campus enrollment allows. Priority is given to applicants who have not yet had the opportunity to complete a bachelor's degree.

Your proposed program of study must either prepare you for graduate or professional school or satisfy some definite educational need or interest. Participants generally enroll full-time for a specified period that does not exceed three quarters. You must meet regular university admission qualifications, and your experience or previous academic record must show potential for success in your proposed program. Additional selection criteria will be applied, and admission is subject to approval by the appropriate department.

Nondiscrimination, Harassment, and Affirmative Action Policies

The University of California, in accordance with applicable federal and state law and university policy, does not discriminate on the basis of race, color, national origin, religion, sex, gender, gender identity, gender expression, pregnancy¹, physical or mental disability, medical condition (cancer related or genetic characteristics), genetic information, ancestry, marital status, age, sexual orientation, citizenship, or service in the uniformed services². The university also prohibits sexual harassment.

This nondiscrimination policy covers admission, access, and treatment in University programs and activities.

Inquiries regarding the University's student-related nondiscrimination policies may be directed to Conduct and Community Standards, (831) 459-1738, or email conduct@ucsc.edu.

Inquiries regarding the University's affirmative action, equal employment opportunity, nondiscrimination, and harassment policies as they relate to student employment may be directed to the Office for Diversity, Equity, and Inclusion, (831) 459-3676 or email cbene@ucsc.edu.

Inquiries regarding the UC Policy on Sexual Violence and Sexual Harassment and UC Santa Cruz Procedures for Reporting and Responding to Reports of Sexual Violence and Sexual Harassment and/or any other violations of Title IX (sex/gender discrimination; harassment or discrimination based on sexual orientation, gender identity, gender expression, or

pregnancy) may be directed to Title IX Officer Cherie Scricca, (831) 459-2462, or email csricca@ucsc.edu.

Student inquiries regarding disability or disability accommodations may be addressed to the Director, Disability Resource Center, (831) 459-2089; or email drc@ucsc.edu.

Students with disabilities who are unable to resolve accommodation or discrimination concerns may contact the campus ADA Compliance Officer by phone, (831) 459-4380, or email ashish@ucsc.edu.

¹**Pregnancy** includes pregnancy, childbirth, and medical conditions related to pregnancy or childbirth.

²**Service in the uniformed services** includes membership, application for membership, performance of service, application for service, or obligation for service in the uniformed services.

UNDERGRADUATE EXPENSES

In this section:

Expenses

In determining the cost of attending UC Santa Cruz each quarter, students should consider both required fees and personal expenses. The figures below are provided to help you draw up a realistic personal budget. If you then conclude you will need financial assistance in order to attend UCSC, you should read the Financial Aid section below. Fees and additional financial information for graduate students appear in the Graduate Studies (p. 1245) section. Tuition, fees, and other charges are subject to change without notice by the UC Regents. For the most current fee information, check Undergraduate Student Fees.

Required Fees

Required fees are due and payable before the start of each quarter. At the beginning of each quarter, you will need sufficient funds to cover tuition and fees, housing, books and supplies, and UC student health insurance (waivable). For many financial aid recipients who are enrolled at least half time, tuition and fees on the student account are paid automatically with approved student aid funds. If you are a financial aid recipient, please note that checks and direct deposits for scholarships, grants, and loans in excess of university charges are not available to you until after the first day of instruction each quarter.

The Student Services Fee funds student services that provide a supportive and enriching learning environment and that are complementary to, but not part of, the instructional program. Programs include, but are not limited to, services related to the physical and psychological health and well being of students; social and cultural activities and programs; services related to campus life; and educational and career support.

Tuition helps support student financial aid and related programs; administration; libraries; operation and maintenance of facilities; the university's operating budget; and all costs related to instruction, including faculty salaries.

Santa Cruz Campus Fees help support a wide range of student services, including college and campuswide student government, extracurricular programs and recreation facilities, campus child care, community and public service projects, Educational Opportunity Programs and scholarships, and free-fare use of the local transit systems. Campus fees paid by graduate students are provided at Student Fees.

In addition, all students, including international students, are assessed a mandatory Health Insurance Premium. The Cowell Student Health Center provides the primary care services for the plan while a contracted insurance company provides major medical and hospitalization insurance. Dependent coverage is also available. Detailed information is available at the Health Center website or at the Student Health Insurance Office, (831) 459-2389.

Waivers from the mandatory health insurance premium are available if you can show that your private insurance provides coverage equal to or better than the student health insurance plan. Deadlines for applying for a waiver are listed in the Schedule of Classes.

Some courses charge an additional **Course Materials Fee**. These fees recover the cost of materials, supplies, equipment, and support services not covered by the normal instructional budget. The fees are reviewed and approved annually by the Miscellaneous and Course Materials Fee Advisory Committee. The list of specific courses charging fees in 2019–20 is available in the quarterly Schedule of Classes and on the web at Course Fees.

Nonresident Tuition

If you are a resident of a state other than California or of another country, you must also pay nonresident tuition, the nonresident educational fee, and other required fees (university registration and Santa Cruz campus fees). The criteria for residency appear in California Residence and Nonresident Supplemental Tuition (p. 1256).

Non-U.S. citizens note: Regardless of how long you live in California, only U.S. citizens and holders of immigrant visas may become qualified for resident classification.

Undergraduate Budget 2021-2022

Undergraduate Budget, 2021-22

	California Residents		Nonresidents	
	One Quarter	F-W-S Quarters	One Quarter	F-W-S Quarters
Students Living On Campus				
Required Tuition and Fees				
Student Services Fee **	\$376.00	\$1128.00	\$376.00	\$1128.00
Tuition ** (a)	3,814.00	11,442.00	13,732.00	41,196.00

Campus Based Fees	500.07	1,500.21	500.07	1500.21
USHIP Health Insurance (waivable)(see above)	986.00	2,958.00	986.00	2,958.00
Subtotal	\$5,676.07	\$17,028.21	\$15,594.07	\$46,782.21

Estimated Personal Expenses (b)

Room and board	\$5,821.00	\$17,463.00	\$5,821.00	\$17,463.00
Books and supplies	381.00	1,143.00	381.00	1,143.00
Personal Expenses	512.00	1,536.00	512.00	1,536.00
Transportation	266.00	798.00	266.00	798.00
Subtotal	6,980.00	20,940.00	6,980.00	20,940.00
Total Budget	\$12,656.07	\$37,968.21	\$22,574.07	\$67,722.21

**Subject to change based on state appropriation and UC Board of Regent’s approval

a) Undergraduates who are unable to maintain a full-time program of study because of employment responsibilities, family obligations, or health problems may be eligible for a 50 percent reduction in tuition. One quarter at \$1,907; two quarters at \$3,814.

b) Estimated personal expenses for students living off campus total \$6,386 per quarter or \$19,158 for three quarters. Estimated personal expenses for students living with family total \$4,067 per quarter or \$12,201 for three quarters.

Late Fees

You may be assessed late fees if you fail to make university payments or enroll by the specified deadlines. Late fee amounts of \$50 each are assessed for a late registration payment and/or late enrollment, \$25 for a late housing payment, and \$25 for miscellaneous fees. Deadlines are published in the Schedule of Classes, and they appear on the Statement of Account.

Estimated Personal Expenses

The figures given for estimated personal expenses are for a single undergraduate living on campus. Expenses will be higher for married students, students with children, and graduate students. The information is as current and as realistic as

possible; however, expenses for students vary in accordance with lifestyles, priorities, and obligations.

Room and board (in college residences). Rates for room and board in the college residence halls depend on the type of accommodation and meal plan. The current rates may be found on the campus Housing Office website. The room and board amount in the Undergraduate Budget table above is the average cost for an on-campus student with the average meal plan and additional Flexi Dollars.

Personal Expenses. This budget item covers a broad range of expenses including clothing, laundry, personal grooming, recreation, and health maintenance. It also covers minimum expenses for modest travel to visit family.

Rates are paid quarterly. The rate ranges listed above do not cover periods of academic recess, nor does the budget above. Housing charges are normally payable at the beginning of each quarter. However, students may arrange with the Campus Housing Office to pay monthly.

More detailed information on room and board expenses for the individual colleges is available in the Undergraduate Housing Rates brochure distributed as part of the admission process or available from the Campus Housing Office, 104 Hahn Student Services Building, (831) 459-2394.

Fee Refunds

Students who cancel their registration before the first day of instruction in a given quarter are refunded all required fees minus a \$10 service charge. New undergraduate students who cancel their registration before the first day of instruction are entitled to a refund of all required fees except the nonrefundable \$250 undergraduate Statement of Intent to Register (SIR) Fee (applied toward the Student Services Fee).

Once the quarter has begun, students must petition for withdrawal. The percentage of fees refunded is determined by the effective date of the withdrawal, according to the schedule below. A student is not eligible for university services after the effective date of withdrawal.

A student entering the armed forces before the sixth week of the quarter is entitled to a full refund of the Student Services Fee—provided no course credit is received.

More detailed information on withdrawal and refund procedures is included in the quarterly Schedule of Classes and The Navigator, both online at the Registrar's website, and in the Graduate Student Handbook. Information on refunds of room and board charges is contained in the campus housing contract, provided to all applicants for on-campus housing. For more information on how withdrawing affects your financial aid, refer to the Financial Aid and Scholarship Office website at Financial Aid and Scholarships website.

Schedules of Refunds

All Continuing and Readmitted Students and New Students Not Receiving Federal Financial Aid

Number of calendar days	Percentage of fees refunded*
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1st day of instruction	100
2-7	90
8-18	50
19-35	25
36 and over	0

New Students Who Receive Federal Financial Aid and Withdraw during Their First Academic Term

Number of calendar days	Percentage of fees refunded*
--------------------------------	-------------------------------------

1st day of instruction	100
2-7	90
8-14	80
15-21	70
22-28	60
29-35	50
36-42	40
43 and over	0

* For new students, the nonrefundable \$250 Undergraduate Statement of Intent to Register Fee is withheld from the University Registration Fee; the schedule of refunds applies to the balance of fees. Percentages listed (days 1–35 or days 1–42) should be applied individually to Nonresident Tuition, the Educational Fee, the University Registration Fee, and Santa Cruz campus fees. The Health Insurance Fee is nonrefundable.

Deferred Payment Plan

The Tuition Deferred Payment Plan (TDPP) provides an alternative method of budgeting and paying registration fees. Fees not covered by scholarships, loans, or other financial aid, can be paid in monthly installments. Students have a choice of applying for a three-month plan for individual quarterly fees, or, at the beginning of the fall quarter only, for a nine-month plan to be used for the fall, winter, and spring quarters. A nonrefundable application fee of \$25 for the three-month plan, or \$60 for the nine-month plan, is billed to the student account upon receipt of the TDPP application. Any student in good financial and academic standing may apply for TDPP. Students receiving financial aid sufficient to cover registration fees in full are not eligible for this plan. For more information about how to apply for TDPP, application deadlines, and campus policies regarding the program, email Student Business Services at sbs@ucsc.edu, or visit the Student Business Services website.

Financial Aid

The university maintains a robust financial aid program of grants, scholarships, loans, and part-time employment for undergraduate students who require financial assistance. The Financial Aid and Scholarships Office administers these

resources to help bridge the gap between the cost of education and what parents and students can reasonably contribute.

If you are a dependent student, the contribution expected from you and your parents is determined through an analysis of your family's financial strength, considering such variables as income, number of dependents, living expenses, and savings and investments (excluding your primary residence). Federal, state, and university policies and procedures are applied. The same analysis is used for married and independent students with the exception of parent information. The federal definition of an "independent student" is used to determine your dependency when you complete the Free Application for Federal Student Aid (FAFSA).

The UC Blue and Gold Opportunity Plan is a Financial Aid Initiative that ensures that undergraduate California residents whose families earn a total income less than \$80,000, meet application deadlines, and who demonstrate enough financial need are guaranteed to receive gift aid from all sources to cover UC systemwide tuition and fees. Qualified students must be in their first four years of attendance (first two for transfer students).

No student will receive more scholarship and grant support than the calculated financial need. All sources of scholarship and grant awards (federal, state, institutional, and private sources, including outside agency scholarships) will count toward covering fees and meeting the Blue and Gold Opportunity Plan commitment. The majority of students who meet the income eligibility standard receive much more grant and scholarship funding than the plan covers.

In addition to the minimum funding under the Blue and Gold Opportunity Plan, undergraduates with sufficient financial need will receive additional grant support to help defray other educational expenses (e.g., books, living expenses, and transportation).

Application Deadlines

The Free Application for Federal Student Aid (FAFSA) may be submitted online at the Federal Student Aid website on or after Oct. 1 of the year prior to the academic year you wish to receive aid (e.g., Oct. 1, 2020, for applicants for fall 2021). Students who are ineligible to complete the FAFSA, but who meet AB 540 criteria, may be eligible to file the Dream Application. Submit a financial aid application each year before the priority deadline of March 2 to be eligible for all types of aid.

Students admitted for fall quarter will receive an estimated financial aid award in April.

The Financial Aid and Scholarships Office may require additional documentation from applicants. These applicants will be sent an email instructing them to login to MyUCSC and view their "To Do List," where required documents are requested (e.g., copies of student and parent tax returns or other forms). These documents must be received by the deadline on the "To Do List" for a student to be considered for all sources of aid administered by UC Santa Cruz. The deadline is June 2.

Conditional awards for admitted students may change as a result of the review of documentation.

Applicants who submit verification documents after the deadlines will be considered for aid based on availability.

Students admitted for winter quarter must have submitted a FAFSA by their admission notification date. Items requested on your MyUCSC “To Do List” must be submitted by December 2. Award notifications will be made as soon as possible after you are admitted/readmitted and all requested financial aid documents are received.

Types of Aid

If you apply for financial aid and meet the application deadlines, you are considered for all types of aid described below. Based on your financial need, your financial aid package may include a combination of grants, scholarships, loans, and work opportunities.

Grants

- **UC Santa Cruz Grants** are awarded to students based on financial need.
- **Cal Grant A & B** (eligible California residents) are awarded by the California Student Aid Commission to California residents who meet eligibility requirements and who demonstrate financial need and academic achievement. In addition to submitting a FAFSA or Dream Application*, first time applicants must also complete and submit the Cal Grant GPA Verification Form no later than March 2. Cal Grant A and B awards pay Tuition and Student Services Fees at UC.
- **Middle-Class Scholarship Grants** are provided by the California Student Aid Commission to eligible California resident students with total family incomes under \$184,000 and net assets less than \$184,000. Grants are awarded on a sliding scale with a cap of 40 percent of systemwide tuition, after considering other forms of grant aid.
- **Federal Pell Grants** are offered to eligible undergraduate students who demonstrate significant financial need based on the expected family contribution (EFC). Awards are variable depending upon the EFC; the maximum Pell Grant for 2020-21 is \$6,395.
- **Federal Supplemental Educational Opportunity Grants** are awarded to undergraduate students who demonstrate significant financial need. These grants supplement the UC Santa Cruz Grant program. Students must meet application deadlines to be considered. The maximum award is \$4,000.

Scholarships

- **UC Santa Cruz Scholarships** range from \$250 to \$10,000 per year. (The average award is about \$1,500.) Funding comes from private donors, alumni, and the university. Entering UCSC students are considered for scholarships based on responses to scholarship questions on the UC Application for Undergraduate Admission. Your application essay will serve as your scholarship

essay. Selected students are notified throughout the academic year. All continuing students are automatically considered for scholarships based on various factors including cumulative GPA.

- **Regents Scholarships** are the most prestigious merit scholarships awarded to undergraduates. Freshman Regent Scholars receive a total of \$20,000 paid over four years. New junior transfers and continuing students selected in the junior year receive the Regents Scholarship for a total of \$10,000 paid over two years. The scholarship amount varies for continuing students based on the year in college and year appointed.
- **Other Scholarships:** Some campus scholarships are restricted to students from particular geographic areas or family backgrounds, or are limited to students in particular majors, classes, or colleges. The donors have different reasons for giving, and their varied interests are reflected in the wide range of scholarships available. Merit and restricted scholarship awards range up to \$5,000.

Need-Based Loans

- **University Loans** are offered to first-year undergraduate students. Repayment begins nine months after a student falls below half time enrollment or graduates from the university. During repayment, the interest rate accrues at 5 percent annually.
- **Federal Direct Subsidized Student Loans** are funded by the federal government and can be borrowed up to the federal limits based on student status (please see Direct Loan Limit Chart below). Students pay an origination fee, which is deducted from the total accepted amount of the loan. Repayment begins six months after a student falls below half time enrollment. Interest rates and loan fees are updated annually and are hosted by Federal Student Aid.
- **CA Dream Loans** are provided to eligible undocumented AB 540 undergraduates to help cover the cost of attending UC. The CA Dream loan program is funded by the state and UC, and aims to close that gap and provide eligible students with the opportunity to borrow student loans to help pay for their education. Repayment begins nine months after a student falls below half-time enrollment or graduates from the university. During repayment, the interest rate accrues at 5 percent annually.

Non-Need-Based Loans

The following loans are available to both undergraduate and graduate students:

- **Federal Direct Unsubsidized Student Loans** are funded by the federal government and can be borrowed up to the federal limits based on student status (please see Direct Loan Limit Chart below). Unsubsidized loans are offered to students who do not demonstrate financial need or who have exhausted all need based aid. Interest

accrues on unsubsidized loans from the date the loan is disbursed. The student pays an origination fee which is deducted from the total accepted amount of the loan. Students may begin repaying principal and interest on Federal Direct Unsubsidized Student Loans immediately, pay only interest immediately, or defer both principal and interest until they are no longer enrolled in school at least half time.

- Federal Direct Parent Loans for Undergraduate Students (PLUS).** Parents of dependent students can apply for a PLUS loan and may borrow up to the full cost of attendance as defined by the UCSC Financial Aid and Scholarships Office. Applicants must pass a modest credit check through the Department of Education for the loan to be approved. Repayment begins six months after a student falls below half time enrollment. Interest rates and loan fees are updated annually and are hosted by Federal Student Aid. Loan repayments begin 60 days after the last disbursement for the academic year (the last disbursement is typically the first day of spring quarter). Parents do have the option to defer payment, similar to the student's ability to defer on their Federal Direct loan above. See your loan servicer for more information.

Annual and Lifetime Federal Direct Student Loan Limits

	Subsidized Loans	Unsubsidized Loans	Combined Subsidized and Unsubsidized Loans
Dependent Students			
Freshman	\$3,500	\$2,000	\$5,500
Sophomores	\$4,500	\$2,000	\$6,500
Juniors and Seniors	\$5,500	\$2,000	\$7,500
Lifetime Loan Limits	\$23,000	\$31,000	
Independent Students¹			
Freshman	\$3,500	\$6,000	\$9,500
Sophomores	\$4,500	\$6,000	\$10,500
Juniors and Seniors	\$5,500	\$7,000	\$12,500
Lifetime Loan Limits	\$23,000	\$57,000	
Graduate Students			
Lifetime	N/A	\$20,500	\$20,500
		\$138,500	

Loan Limits

¹ Refers to students who answered "yes" to any dependency status question on the FAFSA. These loan limits also apply to dependent undergraduate students whose parents were denied a PLUS loan due to adverse credit history.

Other Loans

The University of California develops and publishes lists of private lenders who offer the most favorable terms for UC borrowers. Lender lists may be found on UCSC's Financial Aid and Scholarships website under Private Loans and are also available at www.elmselect.com.

Federal Work-Study

Federal Work-Study gives students who demonstrate financial need the opportunity to work part-time to earn money to help cover expenses while enrolled at UC Santa Cruz.

Some on-campus and community jobs are posted online at the Career Center website Career Center website. Not all campus jobs are posted with the Career Center. Another way to locate on-campus jobs is through networking. Examples include talking to students, staff, and faculty at your college, in your dorm and dining hall, and in the academic departments. The Career Center can help you with résumé writing and job-search strategies. Jobs are competitive, and this award does not guarantee a position.

Loan Forgiveness Programs

The federal government will forgive all or part of a student loan under certain circumstances. Examples of these include performing volunteer work or military service and practicing medicine in certain communities. For a summary of such exemptions, visit the Federal Student Aid website.

More Information

For more information about applying for financial aid, rights and responsibilities, and document deadlines contact the Financial Aid and Scholarships Office at (831) 459-2963 or visit us at 205 Hahn Student Services Building.

Veterans Benefit Services

The VA School Certifying Official (SCO) in the Office of the Registrar is responsible for administering the federal and state Department of Veterans Affairs (VA) educational benefits programs at UC Santa Cruz for students who as veterans, veterans' dependents, active duty, or reservists receive education benefits. Students should contact the Veterans Benefit Services office as soon as they receive notification of admission to UCSC to ensure timely processing of their benefit claims.

The Veterans Benefit Services staff assists with the California Department of Veterans Affairs' college fee-waiver program for

dependents of veterans who have service-connected disabilities or who have died from service-related causes. California resident students may apply for the college fee-waiver program at their County Veterans Services Office. Claims for fee waivers should be presented to the university during the academic year for which the claim applies. Retroactive approval can be granted only in situations in which students applied for the exemption in a timely manner but approval was delayed by the VA's processing of an original or reopened service-connected disability compensation claim. A copy of the initial denial letter and Disability Rating from the VA is required to document such circumstances. The Cal Vet Fee Waiver may only be applied to Summer Session fees if you are a continuing UC student. Note that an application of veterans benefits may impact financial aid eligibility.

UCSC will not prevent enrollment, assess late registration fees, require alternate or additional funding, or deny access to campus resources available for students using VA Education Chapter 33 (Post-9/11 GI Bill®) or Chapter 31 (Vocational Rehabilitation) benefits while payment is pending from the VA (up to 90 days). To qualify, provide a Certificate of Eligibility or an eBenefits GI Bill® Statement of Benefits and all required VA forms needed to certify enrollment by the first day of class. For more information please see the Veterans Benefits and Transition Act of 2018, section 103. GI Bill® is a registered trademark of the U.S. Department of Veterans Affairs (VA).

Veterans Benefit Services is located at 190 Hahn Student Services Building. For more information, visit the Veterans Benefit Services website, call (831) 459-2709 or (831) 459-2910, or email vets_benefits@ucsc.edu.

During their transition to the university and while they are enrolled as UCSC students, military veteran students are provided a broad range of academic and support services by the Veterans Education Team Support (VETS) through Services for Transfer and Re-Entry Students (STARS). The Veterans Resource Center is located at Kresge College right inside the entrance, off the main parking lot. Contact the VETS staff at (831) 459-1520, or send an email to vets@ucsc.edu, or visit the STARS website.

UNDERGRADUATE ACADEMIC PROGRAM

In this section:

Planning Your Academic Program

UC Santa Cruz is on the quarter system. Three quarters—fall, winter, and spring—constitute the regular academic year. Most courses are 5 quarter credits and require approximately 15 hours of work per week in a 10-week quarter (three hours per week, per credit). You are normally expected to enroll in 15 credits each quarter; enrolling in fewer than 12 or more than 19 credits requires approval. If you maintain a B average, you may enroll in more courses without special approval.

Students who enter as frosh are expected to graduate in four years. To do so, you must pass an average of 45 credits per year, to reach a total of 180 credits, the minimum total credits for graduation. Transfer students generally enter with 90-105

credits, and may need more than two years to complete all requirements, depending on their major.

Undergraduate courses are classified as lower division or upper division. Lower-division courses (numbered 1–99) are designed for first-year and sophomore students but may be taken by more advanced students. Upper-division courses (numbered 100–199) are designed for junior and senior students, but may be open to first-year and sophomore students who have sufficient background, or instructor support.

Graduate courses (numbered 200–299) are generally restricted to graduate students. Some undergraduates may enroll in select graduate courses if they can show the instructor that they have completed sufficient preparation for the subject matter of the course.

Here is what to expect during four years at Santa Cruz:

Your advisers can help you plan a program that fulfills graduation requirements while meeting your educational goals (see Advising: From Course Selection to Careers).

During your freshman year, complete your college core course and satisfy the Entry Level Writing Requirement. Begin to take foundation courses for potential majors, along with general education requirements.

If you are uncertain about your choice of major, you may intentionally explore different fields of study during your first two years at Santa Cruz by taking foundation courses that will help you both identify whether a major is a good fit for you and will satisfy prerequisites for declaring the major.

Students who enter as frosh or sophomores are required to declare a major before enrolling in the equivalent of their third year. Students who enter as junior transfers are required to declare their major in their second quarter at UCSC. This means that students interested in majors requiring heavy course prerequisites should be certain they start the appropriate sequences as soon as possible. Transfer students should complete any lower-division requirements for their intended major that are offered at their current campus, and should ensure they have completed any major preparation requirements for admission. Some students may also find it helpful to complete courses that fulfill general education requirements.

During your junior and senior years at Santa Cruz, you will concentrate on the upper-division and comprehensive requirements for your major, as well as completing your general education requirements. If you entered UCSC without having fulfilled the requirement in American history and institutions requirement, you will also need to do so before you graduate.

Graduation Requirements

To qualify for a bachelor's degree, you must meet the following conditions:

- Earn a minimum of 180 credits, each with a grade of D minus or better (or Pass)

- Satisfy the university requirements in American history and institutions and in Entry Level Writing (English composition)
- Satisfy each of the campus general education requirements with a course grade of Pass, C (2.0 grade point average), or better
- Satisfy requirements of your UCSC college
- Complete an approved major program, including its comprehensive requirement, with grades of Pass, C (2.0 GPA), or better in all courses satisfying major requirements. Some majors require grades higher than C to qualify to declare the major. In some majors, courses graded Pass may not be used to satisfy major requirements.
- Have an overall GPA of at least 2.0 in all letter-graded courses taken at UCSC and other University of California campuses
- Have no more than 25 percent of your UCSC credits graded on a Pass/No Pass basis. This includes any credits completed in the Education Abroad Program or at another UC campus in an intercampus exchange program. Departments may require that some or all courses used to satisfy the major must be taken for a letter grade.
- Meet the UCSC senior residence requirement

UC Santa Cruz students are responsible for selecting courses necessary to fulfill graduation requirements and prepare for advanced study or a career. It is essential that you consult regularly with academic advisers about course selection.

Transfer students may be able to use some of the courses they completed at other schools to help meet the 180-credit requirement. (Semester-system credits can be multiplied by 1.5 to derive equivalent quarter-system credit.) The Office of Admissions determines which courses are transferable.

University Requirements

UC Santa Cruz administers three requirements from the University of California: (1) American history and institutions, (2) Entry level writing, and (3) UCSC senior residence.

American History and Institutions

Every candidate for a bachelor's degree must demonstrate knowledge of American history and institutions. Fulfill this requirement in one of the following ways:*

- Achieving a score of 550 or higher on the SAT Subject Examination in U.S. History
- Achieving a score of 3, 4, or 5 on the College Board Advanced Placement Examination in U.S. History, or by achieving a score of 5, 6, or 7 on the IBH History of the Americas Examination
- Completing a college-level course in U.S. history and institutions

- Certification of completion of the requirement on a transcript from an accredited California institution of higher education
- Completing an acceptable history or government course in high school that satisfies the subject requirement for admission to the university, described in Subject Requirements.

A list of courses that fulfill the American History and Institutions requirement, as well as information for satisfying this requirement outside UCSC, is available [here](#).

Entry Level Writing Requirement

Every candidate for a bachelor's degree must demonstrate an acceptable level of ability in English composition. Before the end of your third quarter of enrollment, you must fulfill the Entry Level Writing Requirement in one of the following ways:

Test Scores and Credits

- 30 or better on the ACT, English Language Arts; or
- 30 or better on the ACT, Combined English/Writing (last administered June 2015); or
- 680 or better on the SAT, Evidenced-Based Reading and Writing*; or
- 680 or better on the SAT Reasoning Test, Writing (last administered January 2016); or
- 3 or above on either Advanced Placement Examination in English; or
- 5 or above on an International Baccalaureate Higher Level English A: Literature exam (formerly known as Higher Level English A1 exam); or
- 6 or above on an International Baccalaureate Standard Level English A: Literature exam (formerly known as Standard Level English A1 exam); or
- 5 or above on an International Baccalaureate Higher Level English A: Language and Literature exam; or
- 6 or above on an International Baccalaureate Standard Level English A: Language and Literature exam.

Transfer work

The Entry Level Writing Requirement can also be met by earning a grade of C or higher in an acceptable English composition course offered by a college or university.

Satisfying ELWR at UCSC

Incoming students who have not satisfied ELWR via test or transfer credits will follow a directed self-placement process to enroll in an appropriate writing course at UCSC: WRIT 25, WRIT 26, WRIT 1, or WRIT 1E. Courses are offered in sequence depending on placement. Students who successfully pass WRIT 1 or WRIT 1E will satisfy Entry Level Writing. For additional information on ELWR, please see the Writing Program website.

* All students who enter UCSC as freshmen in 2020 or after must demonstrate their command of the English language by satisfying the ELWR by the end of their third quarter of enrollment. However, students placed into Writing 25 will have until the end of their fourth quarter of enrollment to satisfy the ELWR.

For additional information on fulfilling UCSC's writing requirements, see the Writing Department's program statement.

Senior Residence

Senior Residence

Every candidate for a bachelor's degree must be registered at UCSC for a minimum of three quarters. In addition, of the final 45 quarter credits, 35 must be in regular courses of instruction taken as a registered student at UCSC (including during the summer session). Courses taken through University Extension do not constitute regular courses and therefore do not satisfy residence requirements.

The credit requirement for residence is applied differently to students participating in one or more of the off-campus study programs approved by the Academic Senate or the division. Participating students may satisfy the requirement in either of two ways:

1. Complete 35 of their final 45 credits before leaving the Santa Cruz campus to participate in one or more off-campus approved study programs. In this scenario, students do not have to return to Santa Cruz for any additional coursework after they have finished the program(s).
2. Complete 35 of their last 90 credits at the Santa Cruz campus, with a minimum of 10 credits completed at UCSC after their return from the approved off-campus study program(s).

A student who takes courses outside UCSC, e.g., at community college, may choose at the time of graduation to have only some of the credits completed outside counted toward the 180-credit graduation requirement in order to meet the residency requirement. Subject credit will still be given for lower-division courses and courses at other campuses of the University of California that are not counted toward the graduation requirement. This will not require a petition, and the credit will be reduced by the Office of the Registrar, in consultation with department or college advisers, or the Admissions Office, as needed.

Courses taken through University Extension do not constitute regular courses and therefore do not satisfy residence requirements

General Education Requirements

The general education requirements introduce you to various kinds of information, reasons for learning, and approaches to acquiring knowledge, and promote responsible use of what is learned. Obviously, general education requirements alone

cannot achieve these ends. You are urged to look for as many opportunities as possible to gain a richer understanding of your own cultural heritage and social situation; insight into countries, societies, and eras besides your own; proficiency in another language; understanding of the nature of ethical and moral choice; and expanded knowledge of science and technology. The formal requirements described here should be considered foundations for exploration.

Complete List of Courses That Fulfill General Education Requirements by Course Title

Complete List of Courses That Fulfill General Education Requirements by Course Number

The general education requirements are meant to accomplish several goals:

- Provide students with a base of knowledge and skills that future learning can build on.
- Expose students to a broad range of disciplines and methodologies, to better prepare them for a world of complex problems and rapid changes.
- Enhance the abilities of students to approach problems in appropriately analytical ways.
- Prepare students to function as responsible and informed participants in civic life, considering pressing societal issues (such as the environment, the economy) productively and from a variety of perspectives.

Each area has a general education code, and only courses with that code satisfy the requirement. Codes appear in the course descriptions in this catalog and in the "General Education" field on the MyUCSC Class Search page. Students should review the requirements for their proposed or declared major(s) to ascertain whether some of their general education requirements will be fulfilled by completing their major. As a general rule, each course satisfies only one of the general education requirements.

General Education Requirements

Category	General Education Code	Number of Required Credits
Cross-Cultural Analysis (p. 1200)	CC	5
Ethnicity and Race (p. 1200)	ER	5
Interpreting Arts and Media (p. 1200)	IM	5
Mathematical and Formal Reasoning (p. 1200)	MF	5
Scientific Inquiry (p.	SI	5

1201)

Statistical Reasoning (p. 1201) **SR** 5

Textual Analysis (p. 1201) **TA** 5

Perspectives (choose one from the following three categories) **PE-E** 5

Environmental **PE-H**

Awareness (p. 1201) **PE-T**

Human Behavior

Technology and Society

Practice (choose one from the following three categories) **PR-E** 2

Collaborative **PR-C**

Endeavor (p. 1202) **PR-S**

Creative Process

Service Learning

Composition (p. 1202) **C** 5

Disciplinary Communication (p. 1202) **DC** 5*

*Students satisfy the Disciplinary Communication (DC) requirement by completing one to three upper-division courses required for their major, totaling a minimum of five credits. The DC requirement **must be completed at UCSC**—transfer and EAP courses do not apply to this requirement.

Cross-Cultural Analysis

CC code: one 5-credit course or equivalent. Courses that carry the CC GE designation aim to prepare students for a globalizing world, with increased interaction and integration among peoples, economies, and governments. These courses aim to encourage a broader and deeper understanding of cultures and societies outside the United States. Such courses might provide an in-depth examination of one culture, or one aspect of such culture (for example, art, music, history, language). Alternatively, these courses might aim to help students develop skills of cross-cultural comparison and analysis. A third option is courses that explore topics that are inherently cross-cultural such as international relations or the processes of economic globalization. Whatever the approach, these courses all aim to help students develop the openness and critical perspective necessary for cross-cultural understanding. Although themes of privilege and oppression are centrally relevant to the history and current experience of many cultures, such themes are not required to be addressed in cross-cultural awareness courses.

Ethnicity and Race

ER code: one 5-credit course or equivalent. Courses that carry the ER GE designation prepare students for a state and a world that are increasingly multiethnic and multiracial. Beyond familiarizing students with the culture and/or history of one or more ethnic or racial groups, these courses also aim to develop theoretical and practical understanding of questions such as (but not limited to):

1. how categories of ethnicity and race are constructed
2. the role that ethnicity and race can play in identity formation
3. how ethnicity and race have historically been used to justify forms of enforced inequality
4. contributions of people of various ethnicities to society and to political change

Whatever the approach, these courses are particularly concerned with how ethnicity and race may intersect with other categories such as gender, class, or sexual orientation, to shape self-understanding and patterns of human interaction. While such courses may often adopt an historical perspective on the issues they consider, they will provide a critical perspective on race/ethnicity relevant to the present.

Interpreting Arts and Media

IM code: one 5-credit course or equivalent. Courses that carry the IM GE designation explore the complex ways in which information of all kinds is represented by visual, auditory, or kinesthetic means, or through performance. Contemporary life bombards us with visual and auditory media, often in the form of advertising or advocacy. These courses build in-depth understanding of one or more forms of artistic media: that is, media in which non-textual materials play primary roles. They offer skills in the practice, analysis, interpretation, and/or history of one or more of these media, as well as the ability to analyze the means by which these media encode and convey information.

Mathematical and Formal Reasoning

MF code: one 5-credit course or equivalent. Courses that carry the MF GE designation emphasize university-level mathematics, computer programming, formal logic, or other material that stresses formal reasoning, formal model building, or the application of formal systems. These courses generally focus on one of the following:

1. mathematical reasoning and proof (at least MATH 3 pre-calculus or equivalent)
2. formal logic
3. computer programming
4. other formal systems (e.g., generative grammars, economic models, formal music theory)

Whichever particular approach is used, these classes aim to teach students to think with rigor and precision, using formal or mathematical models to teach the value of logical reasoning and dispassionate analysis.

Scientific Inquiry

SI code: one 5-credit course or equivalent. Courses that carry the SI GE designation teach students about the essential role of observation, hypothesis, experimentation and measurement in the physical, social, life, or technological sciences. Students should acquire key concepts, facts, and theories relevant to the scientific method. By the end of the course they should be able to articulate an understanding of the value of scientific thinking in relation to issues of societal importance. Such courses would allow students to acquire key concepts, facts, and theories relevant to the:

1. physical scientific method
2. social science aspect
3. life sciences
4. technological method

Statistical Reasoning

SR code: one 5-credit course or equivalent. Courses that carry the SR GE designation focus on developing skills in approaching quantitative data and statistical reasoning. These courses help students interpret quantitative claims and make judgments in situations of statistical uncertainty. Such courses might include topics such as:

1. ways of presenting and misrepresenting data
2. statistical inference
3. experimental design and data analysis

Textual Analysis and Interpretation

TA code: one 5-credit course or equivalent. Courses that carry the TA GE designation have as their primary methodology the interpretation or analysis of texts. The aim of these courses is to develop higher-order reading skills and to train students how to read attentively, to think critically and analytically, to produce and evaluate interpretations, to assess evidence, and to deploy it effectively in their own work. These abilities are not only necessary for academic success, but also for full participation in civic life at every level. Textual analysis is the examination of **how and whether** a piece of writing or speaking achieves its aims, whether these are rhetorical and persuasive or aesthetic. Such courses should pay substantial attention not only to what information a poem, political speech, or scientific essay conveys, but to how it goes about doing so (by mobilizing particular metaphors, through plain speaking, via flowery language, by calling on scientific authority, or other mechanism). Please note that close reading leading to summary does not on its own constitute textual analysis.

Perspectives (one 5-credit course or equivalent from any one of the three following categories)

Perspectives: Environmental Awareness (PE-E code). Courses that carry the PE-E GE designation teach students about the complexity of particular ecosystems and/or people's interactions with nature so that students will better understand the environmental issues and trade-offs that are likely to arise in their lifetimes. The interactions between people and the Earth's environment are subtle, complex, and influenced by a variety of natural, scientific, economic, cultural, and political factors. Courses deal with one or more of the following topics:

1. The study of particular ecosystems or environments
2. Natural forces, processes, and their effect on ecosystems
3. Climates, climate models, and climate change
4. Evolution and adaptation to the environment
5. Bio-diversity and/or the robustness of nature and its feedback mechanisms
6. How cultures relate to their natural environments
7. Human efforts to create, preserve, and modify environments
8. Management of natural resources (such as fossil fuels, forests, and fisheries)
9. Issues of sustainability (such as sustainable agriculture or renewable energy)
10. Pollution and its effect on ecosystems
11. Ecological impacts of non-native species and other ecological disasters

Perspectives: Human Behavior (PE-H code). Courses that carry the PE-H GE designation help students to prepare for a world in which many of the most pressing challenges (such as genocide, environmental degradation, poverty) are impacted by human thoughts, decisions, or practices. As well, they provide a kind of "owner's manual" for students to assist them in understanding themselves, their roles (for example, parent, partner, leader), and their social groups (family, workplace, neighborhood, nation). These courses impart specific knowledge about some aspect of individual human behavior or the operation of human groups. As well, they are likely to provide an introduction to one or more specific methodologies, such as ethnography, longitudinal analysis, or experimentation. A central aim, however, is to help students appreciate that better solutions to problems (whether global or personal) can often be found by incorporating information about how humans think, feel, and act.

Perspectives: Technology and Society (PE-T code). Courses that carry the PE-T GE designation focus on understanding technological advances, how they are developed, and their impacts on society. Imparting a basic understanding of the

dynamic technological society in which we live is an essential goal of academic institutions. The study of technology helps satisfy the need of society for knowledgeable people able to understand, participate, and guide the rapid technological advances that play such a vital role in our world.

Practice (one minimum 2-credit course from any of the three following categories)

Practice: Collaborative Endeavor (PR-E code). Courses that carry the PR-E GE designation teach students strategies and techniques for working effectively in groups to produce a finished product. For example, students might learn specialized practical information, such as how to use change-management software to monitor and manage changes initiated by multiple group members. Alternatively, they might learn basic information about leadership, teamwork, and group functioning, which they can incorporate into their own group process. What is common to all courses that carry the PR-E general education requirement is that some instruction regarding the process of collaboration is provided in addition to instruction specific to the academic discipline and the products being produced. In other words, assigning group work is not sufficient; explicit instruction in techniques of collaboration is required.

Practice: Creative Process (PR-C code). Courses that carry the PR-C GE designation teach creative process and techniques in a context of individual or collaborative participation in the arts, including creative writing. For creative writing, students will publish an informal group collection or individual dossier of their successful writings. Courses may combine theory and experiment in the creation of a new artwork, or new interpretation(s) of an existing artwork. Creative Process courses include studies in individual or group creativity or improvisation, and/or ensemble rehearsal and performance. Students who elect to satisfy this requirement will take at least two credits of individual or group creative work; however, the requirement may be satisfied within courses of greater than two credits. Where appropriate, sponsoring units may require a sequence of two or three 2-credit courses with the PR-C designation assigned to the final quarter. For sequences culminating in a semi-professional public performance, an audition at which students demonstrate aptitude and a foundation of skills will be required.

Practice: Service Learning (PR-S code). Courses that carry the PR-S GE designation provide supervised learning experiences where students reflect on, communicate, and integrate principles and theories from the classroom in real-world settings. Service learning provides students with an opportunity to integrate their academic coursework with community involvement. Students gain valuable practical skills while giving back to the community.

Composition

The general education writing requirements at UCSC consist of the Entry-Level Writing Requirement (ELWR), and

Composition (C). Successful completion of College 1 and ELWR are prerequisites for students' enrollment in the C course (Writing 2). Students must successfully complete Writing 2 before the seventh quarter of enrollment.

Disciplinary Communication (DC) Requirement

The goal of this requirement is to ensure that students acquire the skills in writing and other forms of communication appropriate for their discipline. As such, the DC is automatically fulfilled by the completion of major requirements. Students satisfy the DC requirement by completing between one and three upper-division courses required for their major, totaling a minimum of 5 credits. The DC requirement must be taken at UCSC. Any exceptions or substitutions to the Disciplinary Communication requirement must be approved by the Committee on Courses of Instruction.

College Requirements

You must fulfill the requirements of your college in addition to those of your major and of the university. Each college has established a core course, which all first-year students are required to complete. Students admitted as transfer students are exempt from the core course requirement but may take the course at their option on a space-available basis. College requirements are outlined below.

COLLEGE NINE

- College Nine 1, Academic Literacy and Ethos: International and Global Perspectives

COLLEGE TEN

- College Ten 1, Academic Literacy and Ethos: Social Justice and Community, fall quarter

COWELL

- Cowell 1, Academic Literacy and Ethos: Imagining Justice, fall quarter

CROWN

- Crown 1, Academic Literacy and Ethos: Ethical and Societal Implications of Emerging Technologies, fall quarter

KRESGE

- Kresge 1, Academic Literacy and Ethos: Power and Representation, fall quarter

MERRILL

- Merrill 1, Academic Literacy and Ethos: Reading Ourselves, Reading the World, fall quarter

OAKES

- Oakes 1, Academic Literacy and Ethos: Communicating Diversity for a Just Society, fall quarter

PORTER

- Porter 1, Academic Literacy and Ethos: Arts of Reading, fall quarter

RACHEL CARSON COLLEGE

- Carson 1, Academic Literacy and Ethos: Environment & Society, fall quarter.

STEVENSON

- Stevenson 1, Academic Literacy and Ethos: Self and Society, fall quarter

and

- Stevenson 2, Self and Society 2, winter quarter

Advanced Placement and International Baccalaureate Examinations

The university grants credit for College Board Advanced Placement (AP) Examinations on which a student scores 3, 4, or 5 and for International Baccalaureate Higher Level (IBH) Examinations on which a student scores 5, 6, or 7. The university does not grant credit for IB standard or subsidiary level exams.

Students who complete the IB diploma with a score of 30 or above will be awarded six quarter credits toward their UC degree, in addition to the credits earned for individual Higher Level exams (usually 24 quarter/16 semester credits). Students who receive IB certificates with scores of 5, 6 or 7 on Higher Level exams will receive 8 quarter credits.

Designated examinations are awarded elective credits which may be applied to UC graduation requirements for specific subjects and/or for general education/breadth requirements, as determined by each campus. Students who enter the UC with IB credit do not have to declare a major earlier than other students, nor are they required to graduate earlier.

Please see the Exam tables listed below for reference. Students should be aware that AP, IB, and college-level courses will not be granted duplicate credit. In these cases, the university will award credit for only one. 2020-2021 Advanced Placement Exams (AP) and International Baccalaureate Higher Level Exams (IBH) Table

The current AP-IBH chart can also be found at the Admissions website.

The current AP-IBH chart can also be found at the Admissions website.

The AP-IBH chart for 2020-21 can be found here.

Credit for Transfer Students

General Education for Transfers

Transfer students may apply courses taken at other institutions toward lower-division general education requirements. The disciplinary communication course(s) (DC code) must be taken at UCSC.

If you are currently attending one of the California community colleges, see the ASSIST website, or consult with the UCSC Office of Admissions or your current counselor to determine which college courses satisfy UCSC general education requirements.

Transfer students who have satisfied the general education or breadth requirements of another UC campus prior to transfer will be considered to have completed the UCSC general education requirements, with the exception of the DC requirement. Completion of the Intersegmental General Education Transfer Curriculum (IGETC) prior to enrollment at UCSC will also be accepted in lieu of the campus general education requirements, with the exception of the DC requirement.

Intersegmental General Education Transfer Curriculum (IGETC)

The Intersegmental General Education Transfer Curriculum (IGETC) is a series of courses that prospective California community college transfer students may complete to satisfy the lower-division breadth/general education requirements at any University of California or California State University (CSU) campus (see the IGETC table below). This curriculum is the result of an agreement by the University of California, the California State University, and the California community colleges, aimed at simplifying the transfer process for community college students. The IGETC is intended exclusively for California community college transfers and is not an option for continuing UCSC students (including students who transferred to UCSC without having completed IGETC before their first quarter) or for students transferring from four-year colleges or universities.

Official certification for IGETC can only be obtained through a student's community college. Once the official certification is received, students who complete the IGETC prior to transfer are not required to satisfy the UCSC lower-division general education requirements. For students who are partially certified, meaning that they are only missing one or two courses for complete certification, you will be contacted by the Office of Admissions only after the official partial certification is received. Courses used to satisfy IGETC must be completed with a grade of C (2.0) or better. A grade of Credit or Pass may be used if the community college's policy states that it is equivalent to a grade of C (2.0) or better.

IGETC is not recommended for majors that require extensive course preparation, such as any major in the Jack Baskin School of Engineering or the Division of Physical and Biological Sciences.

You may not return to your previous institution to complete IGETC after entering a degree program at UC Santa Cruz. If you do not complete IGETC or partial IGETC prior to beginning at UC Santa Cruz, you are required to complete the UC Santa Cruz general education requirements.

IGETC Subject and Unit/Credit Requirements

Subject Area	Courses Required	Units/Credits Required
1. English Communication One course in English composition and one course in critical thinking/English composition. (Students transferring to CSU must take an additional course in oral communication.)	2 courses	6 semester units or 8-10 quarter credits
2. Mathematical Concepts and Quantitative Reasoning	1 course	3 semester units or 4-5 quarter credits
3. Arts and Humanities Three courses with at least one from the arts and one from the humanities.	3 courses	9 semester units or 12-15 quarter credits
4. Social and Behavioral Sciences Three courses from at least two disciplines or an interdisciplinary sequence.	3 courses	9 semester units or 12-15 quarter credits
5. Physical and Biological Sciences One physical science course and one biological science course, at least one of which includes a laboratory.	2 courses	7-9 semester units or 9-12 quarter credits
6. Language Other Than English Proficiency equivalent to two years of high school in the same language. (Not required of students transferring to CSU.)	Proficiency	Proficiency
Total	11 courses	34 semester units or 45-57 quarter credits

Major Requirements and Course

Prerequisites for Transfer Students

Students who believe they have taken courses at other institutions that satisfy major requirements or UCSC course prerequisites should contact their major adviser for review.

Major and Minor Requirements

To qualify for a bachelor's degree at UCSC, you must complete the minimum requirements for a major program, as well as satisfy university, campus, and college requirements.

At UCSC, you have the option of pursuing a single major, a double major, or a combined major. The minimum requirements for an established major program are set by the sponsoring department. (If you are a transfer student, the department will determine which of your transferable courses may be used to satisfy major requirements.) The major involves substantial work in the discipline and requires no fewer than 40 upper-division or graduate credits. Only courses in which you earn a grade of Pass, C (2.0 GPA), or better satisfy major or minor requirements.

Additional Majors or Minors

To complete multiple majors and minors, you must fulfill all of the requirements for all majors and minors declared, including the comprehensive requirement for each major. In general, a single thesis may not be used for more than one major. You may count courses for more than one major or minor, as long as each major includes 40 upper-division credits not used to satisfy the minimum upper-division credits of any other major or minor, and each minor includes at least 25 upper-division credits not used to satisfy the minimum upper-division credits of any other major or minor.

The diploma of a student who has completed a double major in history and music, for example, would read "Bachelor of Arts with Majors in History and Music."

Declaring a Major

The field of interest you indicate on your application to UCSC does not automatically place you in a major. You are advised to declare your major as soon as possible. Students who enter as lower-division students are required to declare a major before enrolling in the equivalent of their third year.* You will not be allowed to enroll in classes for the equivalent of your third year until you have declared a major. Junior transfer students must declare a major during their second quarter at UCSC by the deadline printed in the Academic and Administrative Calendar.

Be sure you are aware of all the necessary criteria for qualifying for the major. It is wise to apply for major status as soon as you feel sure of the field you wish to enter and have met qualification requirements (if any) for the major you wish to pursue.

Determine the requirements for possible majors as soon as possible. Certain majors require substantial preparation, with many interlocking course sequences and qualifying grades in major foundation courses. If you intend to pursue such a major, start work toward it early in your undergraduate career, and

review your progress toward qualification regularly. (Review majors that interest you in the Academic Programs (p. **Error! Bookmark not defined.**) section of the catalog). Academic advisers can offer assistance in selecting courses appropriate to your individual needs.

***Note:** This is the year you would become a junior given normal progress to degree. For example, if you transfer to UCSC as a beginning sophomore, it is your second year here.

Comprehensive Requirement

Every major at UCSC includes a senior exit requirement designed to integrate the knowledge and skills learned throughout the curriculum. This capstone requirement may be a senior thesis, senior seminar, comprehensive examination, or some other integrative experience. Choices for satisfying this requirement are specified with the requirements for each major.

Minor Programs

See Fields of Study for undergraduate minors currently offered at UC Santa Cruz. Completion of a minor is optional. If you wish, you may complete more than one minor.

The sponsoring department establishes the course requirements for a minor. The minor involves substantial work in the discipline and requires no fewer than 25 upper-division or graduate credits. The minor appears on your official transcript but not on your diploma.

Combined Major

A combined major allows you to complete a course of study involving two disciplines offered as regular programs at UC Santa Cruz.

Examples of combined majors include environmental studies/economics and Latin American and Latino studies/politics. A combined major is designed by faculty representatives from both disciplines. In general, fewer courses are required than for a double major, and students complete the comprehensive requirements as specified for each combined major. Combined majors currently available are listed in the footnotes in the Fields of Study.

The diploma of a student who has completed a combined major in environmental studies and economics, for example, would read "Bachelor of Arts with a Major in Environmental Studies/Economics."

Individual Major

Academically strong students have the option of developing an individual major. Individual majors must be vetted and approved by the Academic Senate (CEP), and must be distinct from any approved major program or possible combination of major programs. Regular deadlines to declare the major also apply to individual majors; students should declare their individual major by the end of their sophomore year.

Because the process of developing and proposing an individual major requires rigorous planning, and approval is not guaranteed, students are advised to pursue an existing major

plan until a proposal has been submitted and approved by CEP. Make an appointment with your college academic preceptor as soon as possible if you are considering this option.

Forming an individual major can be challenging, since three faculty members in the discipline(s) must agree to serve on a committee to supervise the major, and the major must be approved by the Committee on Educational Policy. Guidelines, policies, and forms for individual majors can be found on the Academic Senate website: Individual Major Guidelines and Information, and in Academic Senate Regulation 10.4.5.

Individual majors must include at least 10 courses (50 credits), of which at least eight (40 credits) must be upper-division. No more than two of the required courses may be independent study courses. Students who cannot meet their original study plan for the major must consult with the committee chair, and in some cases, the Committee on Educational Policy, for approval of any changes. All students who complete an individual major are awarded a bachelor of arts.

Catalog Rights

Effective for all undergraduates who entered in fall quarter 1993 or after, students may follow the degree requirements from either the UCSC General Catalog published at the time of entering UCSC or subsequent catalog(s). Students need not follow a catalog in its entirety but may elect to follow different catalog years for their college requirements, university and general education requirements, requirements of their major(s), and requirements of any minor(s).

Catalog year will initially be set for the first year of enrollment at UCSC. Students may elect to follow requirements from other catalog year(s) when filing the Petition for Major/Minor Declaration. All requirements for graduation outlined in the catalog(s) selected must be met before graduation. Changing catalog year(s) is done by contacting your major adviser (for major or minor requirements) or your college adviser (for college, university, and general education requirements).

Students transferring from other collegiate institutions may elect to meet as graduation requirements one of the following:

- those in effect at the time of transfer to UCSC;
- those subsequently established; or
- those in effect when the student entered a previous collegiate institution, provided that entry was not more than three years prior to the time of transfer to UCSC.

Students who seek readmission to UCSC after a break in attendance greater than two years (six regular quarters) must adhere to the graduation requirements in effect at the time of readmission or those subsequently established.

Although general education requirements are determined by catalog year, the specific courses that satisfy a particular GE requirement can change from year to year. The Office of the Registrar annually publishes an updated list of courses that satisfy each GE requirement (except Disciplinary Communication). Since the GE status of a course may change,

to fulfill a GE requirement, a student must take the course in a year in which its GE status is recognized.

The courses that satisfy the Disciplinary Communication GE requirement for each major are published in each year's General Catalog. Students should consult the General Catalog for the year in which they plan to take their DC course(s) to find out the courses that are needed.

Students who entered prior to 1993 should see an adviser. Their catalog year(s) for graduation, whether the year they entered UCSC or subsequent year(s), will be decided at the discretion of their major department and/or their college.

Institutional Responsibility

Undergraduate students who have made significant progress toward a degree in a specific major can assume that a degree will be granted if they meet all catalog degree requirements and maintain continuous enrollment and progress.

Should UCSC find it necessary to discontinue a specific major, every effort will be made to allow currently enrolled majors to complete their degrees within a reasonable period of time. This may include (1) movement to a similar or related degree track; (2) substitution of requirements; (3) development of an individual major proposal; or (4) completion of courses at another University of California campus through the Intercampus Visitor Program. Students with questions concerning this policy should contact their major and college advising offices.

In all cases, any financial obligations are the responsibility of the individual student involved.

Evaluating Academic Performance

UC Santa Cruz has one of the more comprehensive systems for evaluating students' academic performance of any research university in the United States. The evaluation system consists of two major components: the assignment of a final grade in the course and an optional evaluation of your performance.

Evaluations

Beginning fall 2010, undergraduate evaluations are at the option of the faculty. In each course for which you receive a grade of D or better (or P) an evaluation of your academic performance may be submitted. An evaluation may:

- Describe the strengths and weaknesses of your performance in the various areas of class activity (discussion, laboratory work, term papers, examinations)
- Assess your general understanding of the course content
- Recognize additional or particularly outstanding work

Evaluations may be used at UCSC in academic advising, reviewing scholarship applications, and awarding Honors in the major. Evaluations are a permanent part of your academic record. All students may request transcripts either with or without evaluations.

Grades

At the end of each course, you will receive one of the following grade notations:

A excellent

B good

C fair

D poor

F fail

P passing

NP not passing

I incomplete

IP in progress

W withdrawal

The grades of A, B, C, and D may be modified by a plus (+) or a minus (-). You will not receive credit for graduation in any course in which you receive a final grade of F or NP. The grades I and IP are temporary grades used in special circumstances. The final notation W indicates that you officially withdrew from the course before completing it.

Grade Points

Grade points are assigned to a letter grade as follows:

4.0 = A+

4.0 = A

3.7 = A-

3.3 = B+

3.0 = B

2.7 = B-

2.3 = C+

2.0 = C

1.7 = C-

1.3 = D+

1.0 = D

0.7 = D-

0.0 = F

The grades P and NP are not included in calculating your GPA and so are not assigned grade points. Courses in which the interim grades I and IP are assigned earn no grade points or credit until the interim grade is replaced by a final letter grade.

Grade Point Average (GPA)

Undergraduates have a UCSC cumulative grade point average calculated from UCSC courses, courses taken through the Education Abroad Program, and courses taken at another UC campus as part of the Intercampus Visitor Program.

A grade point average is determined by dividing the number of grade points earned by the number of credits attempted for a letter grade. In calculating your UCSC GPA, the interim grades IP and I are not included in the computation because you do not earn those credits until they are replaced with a final grade. (However, when checking for whether you have satisfied the 2.0 UC GPA requirement for graduation, these interim grades are included and counted as courses with grade F [or NP]).

If you repeat a course in which you have received a C-, D+, D, D-, or F, only the last grade recorded shall be computed in your GPA for the first 15 credits of repeated work. After the 15 credit maximum is reached, the GPA will be based on all grades assigned and total credits attempted.

Undergraduates who entered UCSC for the first time in or after fall 1997 and before fall 2001 have a UCSC cumulative grade point average only if they have elected letter grades in at least two-thirds of the cumulative credits attempted. Undergraduates who entered UCSC prior to fall 1997 cannot have an official UCSC grade point average calculated.

Pass/No Pass Option

Students in good academic standing may request to take specific courses on a Pass/No Pass basis. Students receive a P (Pass) for work that is performed at C level or better. Work performed at below a C level receives a notation of NP on the student's transcript, and no academic credit is awarded for the course. Requests for Pass/No Pass grading must be submitted and confirmed by the Grade Option deadline printed in the Academic and Administrative Calendar. If you request P/NP grading in a course and you are later placed on academic probation, your P/NP grading request will be canceled.

No more than 25 percent of the UCSC credits applied toward graduation may be graded on a Pass/No Pass basis.* This includes any credits completed in the Education Abroad Program or on another UC campus in an intercampus exchange program, but does not include transfer work from community colleges or other institutions. Students must be careful about the use of the Pass/No Pass option. Some courses may only be taken Pass/No Pass, and therefore count against the 25 percent Pass/No Pass limit. Several majors require all or most major requirements to be taken for a letter grade; read the major requirements section carefully before using the Pass/No Pass option for any course in a major you are considering.

* Exceptions granted for 2019-2021 courses due to special circumstances: P grades earned in quarters in which remote instruction was the primary means of instruction due to emergency circumstances (spring 2020, summer 2020, fall 2020, winter 2021, spring 2021, summer 2021), and/or P grades given to replace missing grades during fall 2019 or winter 2020 when a letter grade was requested, will not be included in the

calculation of the 25 percent maximum P grades allowed for graduation.

Incomplete

The notation I may be assigned, at the discretion of the faculty teaching the course, when your work for a course is of passing quality but for which some specific required work has not been completed. You must make arrangements with the instructor before the end of the course in order to receive an Incomplete. To remove the Incomplete, you must submit the remaining coursework and file a petition by the deadline printed in the Academic and Administrative Calendar (generally the end of the following quarter). If you do not meet the deadline, the Incomplete lapses to a No Pass or an F, depending on the grading option selected at the beginning of the quarter.

Grade changes (except for I as above) are allowed only to correct clerical or calculation errors by the instructor and must be submitted to the Office of the Registrar by the instructor in charge of the course within one year of the close of the quarter for which the original grade was submitted.

Student Responsibility

Students are responsible for using the Academic Information Systems (AIS) to set and confirm choices for grading options and for ensuring timely completion of all requirements. Students view their schedule at MyUCSC.

Course Loads

The usual course load for UCSC undergraduates is 15 to 19 credits, most often as three 5-credit courses and associated laboratories and sections. After instruction begins, students with a UCSC GPA of 3.0 may enroll in up to 22 credits without special approval and may seek approval for higher loads from their college advising office. Students in their first quarter or with a lower GPA must seek approval from their college advising office for enrollment in more than 19 credits.

College approval is required to carry fewer than 15 credits.

Academic Progress

Academic progress is a measure of the completion of courses with a D- or better, or Pass. Colleges monitor academic progress to ensure you are progressing toward your degree, which must be earned within 15 quarters of enrollment (five years).

Minimum progress is based on length of time at UCSC. The minimum acceptable progress is completion of 36 credits for each academic year, 12 credits for each additional full-time term, and four-fifths of credits attempted for each part-time term. Progress is measured cumulatively, not term by term. For example, a full-time student must complete 48 credits by the end of the first quarter of the second year.

If you do not maintain minimum progress, your college may require you to take higher course loads, complete Summer Session courses, or make other adjustments to your study plan.

A separate financial aid satisfactory academic progress policy (FASAP) defines the GPA and progress requirements for remaining eligible to receive financial aid. Information can be found on the Undergraduate Academic Progress and Financial Aid Information website.

Academic Standing

Academic standing is a measure of performance in completed courses. You must maintain a 2.0 UCSC GPA in order to remain in good academic standing.

If your UCSC term or cumulative GPA falls below 2.0 at the end of any term, you will be placed on academic probation for the next term. You will need to work with your college and major advisers to determine the best way to return to good academic standing. Be sure to take full advantage of the many learning support services available at UCSC.

If your UCSC GPA for any term falls below 1.5, or if you are on academic probation and your cumulative GPA at the end of a term is below 2.0, you are also subject to disqualification. This means that your enrollment at UCSC may be barred for a specific period of time, or you may be disqualified indefinitely from attending the University of California. In many cases, a specific study plan can be developed with your college that will enable you to remain enrolled at UCSC.

For students who entered UCSC prior to fall 2001, academic standing and progress are calculated differently. Contact your college office or see The Navigator for more information.

Financial aid's satisfactory academic progress policy (FASAP) is separate from the Academic Standing policy, and defines additional GPA and progress requirements for remaining eligible to receive financial aid. Information can be found on the Undergraduate Academic Progress and Financial Aid Information website.

Maximum Credits and Years

Students are expected to complete their degree objective(s) within four years, with maximum enrollment limits of at most 225 credits and five academic years (Advanced Placement and International Baccalaureate units are not counted). Upper-division transfer students are expected to complete their degree objective(s) within at most 135 UCSC credits and three academic years.

Colleges may make exceptions to the credit maximum for students in certain cases. Such exceptions are conditional on maintaining academic standing, minimal progress, and progress toward the degree objective(s).

Students in danger of exceeding the credit limit or the five-year or three-year limit may be required to modify their degree objective, such as by completing a major without a minor or double major, or completing a related major with fewer course requirements.

Repeating Courses

Undergraduates may repeat courses in which they earn a C-, D+, D, D-, F, No Pass, or W. For an undergraduate to repeat a

course more than once requires approval of the student's college. A grade of W counts as an attempt. Courses in which a C-, D+, D, D-, or F is earned may not be repeated on a Pass/No Pass basis. Courses in which a grade of No Pass is earned may be repeated on the same basis or for a letter grade. For the first 15 credits of repeated courses, the original grade is excluded from the GPA, and only the grade from the repetition is used. After the 15-credit maximum is reached, all grades are included in the GPA. However, credit is not awarded more than once for the same course. The grade assigned each time the course is taken will be permanently recorded on the official transcript.

Academic Integrity

The university is dedicated to the unhindered pursuit of knowledge and its free expression. It is essential that faculty and students pursue their academic work with the utmost integrity. This means that all academic work produced by an individual is the result of the sole effort of that individual and acknowledges the contributions of others explicitly. It is the responsibility of students and faculty to be absolutely clear about what constitutes plagiarism, cheating, or other violations of academic integrity. Violations of academic integrity by students result in both academic sanctions (e.g., failing the course) and disciplinary sanctions (e.g., suspension or dismissal). Consult the campus's undergraduate academic misconduct policy for more information.

Undergraduate Honors

UC Santa Cruz awards several honors for outstanding academic achievement.

Dean's Honors

Students will be eligible for quarterly Dean's Honors if they have earned a minimum of 15 units that quarter, of which at least 10 are graded, with a term grade point average (GPA) equal or higher than that required for University Honors at graduation in their group* for the current academic year. The notation "Dean's Honors" will appear on the transcript.

***Note:** GPA thresholds for Baskin School of Engineering majors are calculated separately from those of majors in all other divisions.

Honors at Graduation

Honors at graduation are awarded by the university and by the separate majors based on a review of their graduates' academic records. In general, honors are limited to 15 percent of the graduating class. University Honors are based on the cumulative UC GPA. Faculty review of major honors may involve additional criteria.

University Honors

To be considered for University Honors at graduation, students must have completed 70 or more credits at the University of California and have attained in their group* a UC GPA that places them in the rankings as follows: Summa Cum Laude, top 2 percent; Magna Cum Laude, next 3 percent; Cum Laude, next

10 percent. Each year and for each group, the registrar will calculate the GPA thresholds required for these levels of University Honors, based on the GPAs of recent graduates. The notation "University Honors" will appear on the diploma and transcript.

* **Note:** GPA thresholds for Baskin School of Engineering majors are calculated separately from those of majors in all other divisions.

Honors in the Major

At graduation, the department sponsoring a student's major program may confer Honors or Highest Honors in the major. This notation appears on the transcript as well as on the diploma. In general, no more than 15 percent of the graduation class in a major will be awarded Honors at graduation.

Deadlines

To ensure consideration for honors in the major, students should apply to graduate by the Registrar's deadline.

Any student who has a reportable disciplinary sanction for a violation of academic integrity policies may be ineligible for any honors designation, at the discretion of the agency that awards the designation.

Undergraduate Honors Opportunities

College Scholars Program

The UC Santa Cruz College Scholars Program offers a congenial and stimulating academic home for a select group of well-prepared students at UC Santa Cruz. College Scholars can expect to challenge themselves academically, find other students who are similarly motivated, and explore undergraduate research. This enriched program of study includes special courses, seminars, colloquia, and other events during each quarter of the academic year. College Scholars participate in demanding, small-scale, and research-oriented courses that catalyze creative thinking and offer a springboard to other undergraduate research opportunities.

Admission to the Fall Start cohort of the College Scholars Program is by invitation. A select group of UCSC applicants offered admission to the university will be invited to join the program, based on their record of academic achievement. Students can also apply for the College Scholars Program after the fall of their first year ("Spring Start"). In this case, students will join the program during the spring research colloquium. Spring Start students are selected based on applications submitted through their college.

Honor Societies

Many UC Santa Cruz students are members of departmental, professional, local, and national honor societies whose goals are to recognize and improve scholastic standing in an area of interest. Among these are Phi Beta Kappa, the oldest national society that advances scholarship and recognizes excellence in the liberal arts and sciences; Tau Beta Pi, the engineering honor society that recognizes students of distinguished scholarship,

exemplary character, and dedication to service; the Golden Key International Honour Society, which provides recognition and leadership opportunities to top-performing students; and Psi Chi, which encourages, stimulates, and maintains excellence in scholarship, and advances the science of psychology.

Awards and Scholarships

UC Santa Cruz has a variety of scholarship and award opportunities that are designed to reward, encourage, and assist students in pursuing academic excellence and leadership roles. Students can find such opportunities through their colleges, departments, divisions, and various external agencies.

UCSC provides support for students for a variety of prestigious scholarships and awards such as the Karl S. Pister Leadership Opportunity Award, Deans' and Chancellor's Awards, Steck Foundation Award, Boren Scholarship, Donald A. Strauss Scholarship, Fulbright U.S. Student Program, Scholarship, Marshall Scholarship, and Rhodes Scholarship.

Transcripts

Academic records are maintained by the Office of the Registrar, which will issue an official transcript only on your authorized request.

For information on ordering transcripts, please refer to Registrar's Registrar's transcripts website.

If you have outstanding financial obligations to the university, a hold may be placed on your transcript. Students may access their unofficial transcript on MyUCSC.

Transcripts for UCSC Extension courses should be requested from UCSC Extension Records, 3175 Bowers Ave., Santa Clara, CA 95054-3003, (408) 861-3700.

Privacy of Records

UCSC students are informed annually of the federal Family Educational Rights and Privacy Act (FERPA) and its provisions. This act, which the institution follows, was designed to protect the privacy of education records and to provide guidelines for the correction of inaccurate or misleading data through informal and formal hearings. Students also have the right to file complaints with the Family Educational Rights and Privacy Act Office concerning alleged failures by the institution to comply with the act.

UCSC policy explains in detail the procedures to be used by the institution for compliance with the provisions of the act. FERPA guidelines are available at Privacy of Student Records. The full text of the University of California policies applying to the Disclosure of Information from Student Records is online: registrar.ucsc.edu/records/disclosure/index.html.

Questions concerning the Family Educational Rights and Privacy Act may be referred to the Office of the Registrar, 190 Hahn Student Services Building.

Advising: From Course Selection to Careers

Academic Advising

Academic advising at UC Santa Cruz aims to assist students in clarifying their educational goals and in developing academic plans to achieve them. The core of UCSC's advising system is housed in the colleges and academic programs and is supplemented by advising and support services throughout the campus.

College academic advisers (some of whom are called "academic preceptors") are generalist advisers who focus on orientation to the university, pre-major advising, academic success, and campuswide requirements such as general education and university requirements. Each college has an advising team that can provide you with individual and group advising and can refer you to resources and educational opportunities. You remain affiliated with your college advisers throughout your undergraduate career.

Staff advisers in UCSC's academic programs (sometimes called "major advisers") focus on areas related to a student's major or minor. Major advisers can help you understand declaration and major requirements, and can assist you in planning a program of study. They can help you identify enrichment opportunities within the major and refer you to appropriate faculty advisers. Faculty advisers may serve as mentors in your field, recommending courses and helping you refine your educational goals. For transfer students and for students in many majors (such as those in the physical and biological sciences, engineering, and the arts), it is important to review information provided by major advisers prior to your first quarter on campus.

For help in assessing career interests and exploring and choosing career options, contact the Career Center. The staff also can assist you with choosing a major, résumé preparation, interviewing skills, applying for an internship, and job-search strategies.

If you plan to go on to graduate school, consult with faculty in your major. Faculty advisers are the best people to ask about the quality of graduate programs in your field of interest. In addition, the Career Center offers advising and workshops on applying to graduate school.

If you intend to pursue graduate study in a field not offered as a major at UCSC, you can often prepare for your intended program through one of the campus's regular majors. You must plan your studies carefully, however, and advising will be especially important. The Career Center has information that will help prepare you for graduate and professional programs. The following are some fields in which UCSC alumni have pursued graduate study and successful careers:

- Business
- Conservation
- Film
- Finance

- Guidance and counseling
- Health fields
- High-tech industry
- Human resources
- Industrial and labor relations
- International relations
- Law
- Marketing
- Museum administration
- Public administration
- Urban planning

The Career Center includes advisers with specialized expertise in preparing for careers in medicine or another health-related field (including dentistry, nursing, nutrition, occupational therapy, optometry, osteopathic medicine, pharmacology, physical therapy, public health, and veterinary medicine), and in preparing for careers in law.

A number of programs provide additional academic and comprehensive support services to students with specific needs. Educational Opportunity Programs (EOP), Services for Transfer and Re-Entry Students (STARS), and the Disability Resource Center are described below. Counseling on personal and family issues is available through Counseling and Psychological Services. If you need assistance that is not listed in this section, consult The Navigator or check with your college advisers.

Your first step in accessing advising at UCSC is to complete the online Slug Orientation courses.

Orientation

All new UC Santa Cruz students are expected to participate in an online orientation. This orientation begins the process of academic advising and provides a comprehensive introduction to all aspects of UCSC. After participating in online orientation, students may choose and enroll in classes for their first term.

Summer Orientation is held over the course of the summer and includes separate programs for first-year and transfer students. Orientation is mandatory for all students, and is a gateway to enrolling in the first quarter's classes.

Fall Welcome Week, scheduled approximately five days prior to the beginning of fall quarter, is the next step in the orientation and advising process for new students entering fall quarter. It provides students with an opportunity to settle into life at UCSC, take advantage of important services, and continue their academic advising. Questions about Summer Orientation and fall Welcome Week can be directed to the Office of Campus Orientation Programs at (831) 459-5468, or via email to orientation@ucsc.edu. Information is also available at Campus Orientation.

International Orientation is required for all international students regardless of residency status. The mandatory International Orientation program eases students' transition to university life and introduces students to a research university's academic expectations, UC level writing norms, campus resources, and the UCSC and Santa Cruz communities. International Orientation is scheduled prior to Welcome Week and the beginning of fall quarter. For more information, please visit the International Orientation website.

Career Center

UC Santa Cruz graduates find success in many different career fields. Their superior education is the foundation for this success. The staff at the Career Center will help you link your educational experience to the world of work. The center provides a variety of employment and career-development services to help students obtain rewarding and successful careers.

Both undergraduate and graduate students are encouraged to visit the Career Center often throughout their time on campus. The first step is to meet with a career adviser to begin developing a focused career plan. Simply sign up online for an advising appointment through SlugQuest on the Career Center website. Advisers assist students in selecting majors, finding internships and part-time jobs, applying to graduate school, conducting a job search, and much more. Workshops offered by the Career Center include: Finding and Applying to Internships; Résumé and Cover Letter Writing; Applying to Graduate and Professional School; and special workshops on specific majors or career fields. Check out the Career Planning Guide for additional career development activities suggested for students from first year through senior year.

Your college experience is likely to include a part-time job or internship in your area of interest. An internship is one of the best ways to gain practical work experience in your area of interest. The Career Center has hundreds of opportunities available. Off-campus and on-campus employment opportunities (both work-study and non-work-study) are posted on the Career Center's website.

The Career Center's website contains a wealth of material on career exploration, graduate and professional schools, job search, career fields, internships, and employers. One of the most exciting online resources is the Career Advice Network, which helps students connect with alumni in their field of interest who have a desire to assist other Slugs.

UC Santa Cruz students and alumni looking for full-time career opportunities need look no further than SlugQuest—an online site that lists job openings targeted to UCSC graduates. You may connect to SlugQuest on the Career Center website. Another way to obtain a career position is to participate in the On-Campus Interview Program. Recruiters visit campus every fall, winter, and spring to interview and hire students. The Career Center website has a list of participating companies.

The Career Center sponsors several major events every academic year. The Graduate and Professional School Fair brings representatives from the nation's top universities to campus to share information about their advanced-degree

programs. Job and internship fairs, which bring hiring companies to campus, take place multiple times each year. Students looking for a job or internship will want to arrive prepared with a great résumé. Other events include the Multicultural Career Conference, which brings students and alumni together to develop mentor relationships and explore careers.

The Career Center—located at the Bay Tree Building, Room 305, in Quarry Plaza—can be reached at (831) 459-4420. Office hours are 8 a.m. to 5 p.m.

Educational Opportunity Programs (EOP)

The Educational Opportunity Programs (EOP) provide a variety of academic and personal support designed to improve the retention and academic success of first-generation low-income and educationally disadvantaged college students. EOP helps ensure that these students successfully complete their undergraduate education and acquire the skills to prepare for graduate and professional school, as well as for future leadership roles. EOP offers the following programs.

Advising Programs and Services

EOP Advising programs and services are designed to facilitate personal growth and development with the goal of achieving academic and social integration, academic achievement, and exposure to opportunities beyond the baccalaureate degree. These programs and services include:

- Advising and counseling
- Personal counseling
- Referrals to resources, programs, and opportunities
- Peer advising

Bridge Program

The Bridge Program is a first-year experience program that supports and guides students in their transition from high school to the university. Participants are first-generation college students who may come from low-income backgrounds and under-resourced California high schools. The program is designed to prepare students for the academic rigors of the university by providing them with the tools and resources necessary to achieve academic excellence in their first year and throughout their undergraduate career.

Support Services for AB540 Students

AB540 Student Services provides a broad range of support services designed to address the needs of AB540 students. These services address the gaps that AB540 students face within the university and enhance student achievement. Services provided to students include mentoring, community-building events and programs, personal advising, and student-based support.

Textbook Lending Program

This program is designed to assist students in obtaining required textbooks that they would not be able to purchase on their own due to cost. To receive textbook assistance, students must demonstrate financial hardship and must have exhausted all other forms of financial aid available to them. This includes all forms of loans (subsidized and unsubsidized).

Pre-Graduate Programs

EOP also sponsors two pre-graduate programs designed to increase the placement of EOP students in professional and doctoral programs and to encourage the pursuit of academic careers.

- **The Graduate Information Program (GIP)** supports students seeking to pursue graduate and professional school education. Services include graduate and professional school advising; graduate school application and internship-related workshops; graduate school resource library and website; website to conferences and forums
- **Pathways to Research (P2R)** exposes undergraduate students to research opportunities and research-based graduate programs. With the assistance of their graduate mentor, participating students determine their short-term goals for the quarter and long-term goals for the school year related to exploration of and involvement in research. Students engage in bi-weekly meetings with their mentor to report on progress and plan next steps to reach their goals. P2R is a two-quarter commitment (Winter and Spring). Mentees will receive a \$300 stipend upon successful completion of the program.

For information about any of these programs, please call the EOP office at (831) 459-2296 or visit eop.ucsc.edu.

MARC and IMSD Programs

The Division of Physical and Biological Sciences sponsors two National Institutes of Health grant programs: the Maximizing Access to Research Careers (MARC) Program and the Initiative for Maximizing Student Development (IMSD) Program.

Though separately funded, the projects share a similar mandate: to increase the number of well-prepared, under-represented, ethnic-minority, and disadvantaged-background students who are admitted to graduate or professional schools in biomedical sciences. The program seeks students from groups that have traditionally been denied equal access to educational opportunities in the science professions.

UCSC students should apply in their sophomore year or as juniors staying a 5th year. Both programs require a two-year commitment. In addition, a student should be in the process of completing specific introductory courses in biology, chemistry, and mathematics because the program begins in the summer. The MARC and IMSD programs aim to introduce students to program faculty, their research, and laboratory research techniques. After students successfully complete the summer program, they have the opportunity to work in a faculty lab for the following academic year. Financial compensation is

available for laboratory research and participation in the summer program.

MARC and IMSD are housed under the STEM Diversity Programs and run in conjunction with UC LEADS and CAMP. The STEM Diversity Programs also work with other offices to help make the most of campus resources and provide practical assistance with the graduate school admission process. Additionally, the staff maintains an information file on summer enrichment programs (which can provide you with vital research experience), conferences, professional development workshops, journal clubs, and seminar courses. Students admitted to the program are supported by a well-equipped student office, which provides additional academic support and a convenient place for students to meet.

For further information, contact the STEM Diversity Programs office to learn more about eligibility requirements and visit the STEM Diversity Programs website or email STEM Diversity Programs Director Yulianna Ortega at yuli@ucsc.edu. The application will be available Dec. 1, 2016. Deadline for 2017-2019 cohorts is Feb. 10, 2017.

Academic Excellence Program (ACE)

ACE is a nationally recognized academic support program that is designed to increase the diversity of students who earn bachelor's degrees in science, technology, engineering, and mathematics (STEM). ACE offers active-learning problem solving sessions for selected mathematics and science courses.

The sessions provide a structured setting where students teach and learn from each other. An ACE session leader, who has an academic background in the subject, facilitates the problem solving sessions. Undergraduate co-leaders/peer mentors assist, bringing the student-to-teacher ratio to approximately 12:1. In addition to attending their ACE problem-solving sessions, students meet weekly with their peer mentor, who shares study strategies as well as opportunities for undergraduate teaching and research internships. ACE session leaders offer weekly office hours, as well as examination review sessions and academic and career planning. ACE students join a community of STEM scholars who are dedicated to academic excellence and success.

Applications are accepted quarterly for the upcoming term. Enrollment in ACE is limited and priority is given to EOP students who are planning to pursue a STEM major. For more information, visit the ACE website.

Multicultural Engineering Program (MEP)

Also known as the MESA Engineering Program, MEP is the university-level component of Mathematics, Engineering, Science Achievement (MESA), a statewide program of the University of California Office of the President. At UC Santa Cruz, MEP is supported by the Baskin School of Engineering. Its goal is to promote the retention and graduation of a diverse population of students, especially those from groups that remain the most underrepresented in engineering studies.

MEP provides academic and personal support for engineering students who are first-generation college students, are the first

in the family to pursue engineering or computer science studies, or are from a low-income (limited financial resources) or educationally disadvantaged background. MEP's academic learning community supplements students' undergraduate experience and encourages them to continue their education by attending graduate school. MEP has a strong support system and engages students' full participation in a variety of services and activities. These include academic advising, personal counseling, tutorial services, drop-in assistance, individual and small-group study, study-skills workshops, peer-support networks, community-building activities, scholarships, and an engineering Summer Bridge program for a select group of entering first-year students.

MEP's well-equipped study center and computer lab provides 24-hour access to computer workstations and printer, textbooks, individual lockers, and a place for students to gather and study. Students who have participated in pre-university service programs (e.g., Early Academic Outreach, Upward Bound, MESA, Talent Search, Puente, DEEP, Smith Scholastic Society) are encouraged to apply to MEP.

For further information, call (831) 459-2868, visit the MEP website, or drop by the School of Engineering Undergraduate Affairs Office, 231 Baskin Engineering Building.

Services for Transfer and Re-entry Students (STARS)

Services for Transfer and Re-entry Students (STARS) offers a broad range of personal and academic support services for all transfer and re-entry students (undergraduates 25 years and older, graduate students 29 years and older), students who are parents regardless of age, and military veterans. These services include admissions information; orientations for new students; academic seminar courses; study skills workshops; tutorial services; informal academic advising; drop-in assistance; social, recreational, and cultural programs; scholarships; newsletters; and study centers with computer workstations. STARS also acts as a clearinghouse for information about campus and community resources for UCSC's large transfer and re-entry student populations.

STARS is located at Kresge College, on the floor above the College Office. All current and prospective transfer and re-entry students are invited to visit. Hours are 9:00 a.m.-7:00 p.m., Monday through Thursday, and to 5:00 p.m. on Friday.

Veterans Education Team Support (VETS) is a STARS program for veterans returning to school. In this peer mentor program, veterans meet each other and receive assistance as they navigate admission and transition into university life. Ongoing personal and academic support and outreach to prospective students are also offered.

The Smith Renaissance Scholars Program, which helps current and former foster youths pursue their educational goals, is affiliated with STARS.

The Osher Lifelong Learning Institute at UCSC, a UC/community organization dedicated to continuing education, is also under the STARS umbrella. The organization hosts monthly meetings with university faculty, offers courses taught

primarily by emeriti faculty, and coordinates a wide variety of peer-led interest groups.

The Retirees and Emeriti Center, located at STARS, provides a resource for faculty and staff of UC Santa Cruz as they transition to and engage in retirement.

For further information regarding all the STARS programs, call (831) 459-2552. For current programs and activities, visit the STARS website.

Disability Resource Center (DRC)

The campus accommodates students with disabilities and welcomes their attendance at UCSC. The Disability Resource Center (DRC) provides services such as disability-related advising, authorization for testing accommodations, conversion of print materials into alternative formats (audio, electronic, Braille), adaptive equipment loans, notetakers, sign language interpreters, real-time captioning services and referrals to appropriate campus or community resources.

The Disability Resource Center is located at 125 Hahn Student Services Building and can be reached by phone at (831) 459-2089, or via email at drc@ucsc.edu. More information is available on the Disability Resource Center website.

Campus access for people with mobility impairments. Visit the campus Americans with Disabilities Act website for more information about accessibility maps, vehicles equipped with wheelchair lifts that can transport students throughout campus, and permits for accessible or medical parking spaces that are adjacent to all campus buildings. Most buildings on campus have wheelchair-accessible ramps, modified rest rooms, and other facilities. If necessary, classes are rescheduled to meet accessibility needs.

Questions and concerns can be directed as follows:

- Education/program accessibility should be addressed to the director of the Disability Resource Center, at (831) 459-2089 (voice).
- Facility or transportation access should be directed to Facilities Access Coordinator (831) 459-3759 (voice).
- Computing access to the campus should be directed to IT Accessibility Coordinator (831) 459-2410.
- Accommodating job applicants or current employees with disabilities should be directed to (Disability Management Coordinator, Benefits Office (831) 459-4602 or Assistant Director for EEO, Office for Diversity, Equity, and Inclusion (831) 459-3676).

ROTC and Military Affairs

UC Santa Cruz Air Force ROTC

Students interested in participating in Air Force Reserve Officer Training Corps (AFROTC) have the option of attending AFROTC classes at San José State University while taking other academic classes at UC Santa Cruz.

San José State University supports a wing of AFROTC with cadets from San José State University, Santa Clara University, Stanford University, UC Santa Cruz, and many local community colleges. The Air Force ROTC program is designed to provide instruction in leadership, management, and national security studies along with military education and training. This prepares the cadet for assignment to positions of responsibility and importance in the modern Air Force. Instruction is conducted on and off campus. This program offers all eligible students the opportunity to obtain an officer's commission in the United States Air Force while earning their college degrees.

Program Overview

Our faculty brings a wealth of experience and diversity to the program. Instructors are Active Duty Air Force officers from various career areas and provide students with a first-rate academic education and military training experience. Each faculty member also acts as a student adviser to guide students through the program and help them reach the goal of an officer's commission in the United States Air Force.

College students wishing to commission as an Air Force officer through ROTC may enroll in a three-, or four-year program. Students attend Air Force ROTC classes along with other college courses and receive elective academic credit. AFROTC courses are sequenced by subject area for specific and logical reasons. Please see <http://www.sjsu.edu/afrotc/> for course information. After successfully completing all requirements, the cadets are commissioned as Air Force officers.

For information on the Air Force ROTC program, contact the Department of Aerospace Studies, AFROTC Det 045, One Washington Square, Industrial Studies Building, Room 214, San Jose State University, San Jose, CA, 95192-0051. Phone: (408) 924-2960. Email afrotc@sjsu.edu or visit the website: <http://www.sjsu.edu/afrotc/>. Students may call or inquire about program prerequisites, scholarship availability, and class schedules at the Department of Aerospace Studies.

UC Santa Cruz Army ROTC

The Army ROTC (Reserve Officers' Training Corps) is one of the best leadership courses in the country and can be part of your college curriculum. UC Santa Cruz students have the opportunity to take ROTC courses with cadets from other local campuses including Santa Clara University, Stanford, and San Jose State University. Cadets from UC Santa Cruz have flexible options to meet ROTC class requirements such as local classes on campus, shuttles to Santa Clara University, or by virtual attendance of classes at Santa Clara University through the Army's online meeting application. During classes, leadership labs, physical training, and field training exercises, Army ROTC students will learn firsthand what it takes to lead others, motivate groups and conduct missions as an officer in the Army. Upon graduation from Army ROTC, students will earn the bar of a second lieutenant and be commissioned into the Active Army, Army Reserve or Army National Guard.

Army ROTC at Santa Clara University is a program that fosters the development of cadets' academic, athletic, professional, and mental strengths. Students attend class and physical training for three hours each week, along with a Wednesday lab session that

features hands-on instruction regarding Army operations and leadership situations. This program is ideally designed as a four-year process. Cadets spend their first two years familiarizing themselves with the Army, and in their third year they are expected to perform and improve as leaders in preparation for a summer leadership development camp at Ft. Knox, Kentucky. The fourth and final year of Army ROTC introduces cadets to the responsibilities of military staff, teaching them to plan, train, lead, and develop their junior cadets in preparation for their commission. A typical four-year education with Santa Clara University ROTC comes with a service obligation of four years in the Army.

Army ROTC also gives cadets the opportunity to gain further Army experience by earning appointments to Army training schools where they will parachute from airplanes or rappel from helicopters. In addition, cadets are allowed a single quarter of study abroad, as well as the opportunity to participate in Army-funded immersion trips to dozens of countries across the globe in the summer months.

Cadets who graduate from the program will compete for active duty and reserve positions across the Army. Active officers have a full-time position and serve for a minimum of four years. Reserve officers serve for eight years part-time in either the National Guard or Army Reserve.

For more information about ROTC opportunities and scholarships contact Mario Morales by email at memorales@scu.edu or by phone at 408-554-6840, or visit the Army ROTC website at <http://www.scu.edu/rotc/>.

For more information regarding Army ROTC please visit the Army ROTC website at <http://www.goarmy.com/rotc.html>.

Undergraduate Research

At the best research universities, professors bring knowledge and creativity from their cutting-edge research into the classroom, integrating the canon of the discipline with its future directions. UC Santa Cruz takes this further with a special tradition of undergraduate research outside the classroom. UC Santa Cruz, its departments, and faculty offer undergraduates many ways to get involved in research and creative activities. These opportunities develop advanced skills and insights and provide an early introduction to the nature of graduate studies. Research projects can help students launch careers, secure admissions to top graduate schools, and truly make an impact on society.

Many majors incorporate research into their senior comprehensive requirement, with options or requirements of a senior thesis, capstone project, or other creative endeavor based on students' individual research. Other opportunities for undergraduates include structured internships or research programs, joining ongoing faculty research or creative projects, or developing their own projects under faculty supervision. The following sections discuss a sampling of UCSC's international education, field-study, and exchange programs, which enable students to deeply enrich their undergraduate experience and education as they learn by doing. For additional information, see Undergraduate Research Opportunities.

UC LEADS

After being selected as UC LEADS Scholars, students begin a two-year program of scientific research and graduate school preparation guided by individual faculty mentors and program staff. Scholars are provided with an excellent opportunity to explore their discipline, experience a research environment, and improve their opportunities for future study in their chosen field. Each scholar is mentored by a member of the UC faculty who assists the student in designing a plan of research and enrichment activities tailored to his or her individual interests and academic goals. Scholars attend the annual statewide symposium, as well as are sponsored to participate in another STEM conference of their choice each year.

The UC LEADS program is headquartered in the STEM Diversity Programs office, along with MARC, IMSD and CAMP. To learn more about eligibility requirements and the UC LEADS program, visit the STEM Diversity Programs website or email STEM Diversity Programs Director Yulianna Ortega at yuli@ucsc.edu. The application will be available Dec. 1, 2016. The deadline for 2017-19 cohorts is Feb. 10, 2017.

California Alliance for Minority Participation (CAMP)

CAMP is a statewide initiative that aims to support and retain underrepresented undergraduates to achieve their degrees in the biological sciences, physical sciences, mathematics, and engineering.

By integrating research and undergraduate education, CAMP creates a cohesive set of experiences that fully prepares undergraduates for graduate studies. CAMP motivates participants through cooperative learning, internships, faculty mentored research, and travel to professional conferences.

The CAMP program is headquartered in the STEM Diversity Programs office along with MARC, IMSD and UC LEADS. To learn more about eligibility requirements and the CAMP program, visit the STEM Diversity Programs website or email STEM Diversity Programs Director Yulianna Ortega at yuli@ucsc.edu. The application will be available Dec. 1, 2016. The deadline for 2017-19 cohorts is Feb. 10, 2017.

Global Engagement

The Division of Global Engagement promotes international cooperation in teaching, research, and other fields of mutual interest with the development of formal partnership and affiliation between UC Santa Cruz and universities, foreign government agencies, and non-profit organizations abroad. Within Global Engagement are the units of Global Learning, International Scholar and Student Services (ISSS), Global Programming, and Global Initiatives.

For further information, contact Global Engagement, 103 Classroom Unit Building, (831) 459-2858, email: global@ucsc.edu.

Global Learning

Through academic coursework, internships, and experiential learning, UC Santa Cruz Global Learning aims to:

- provide students the opportunity to graduate with global experience;
- promote an internationalized campus that cultivates an understanding of our diverse global community; and
- encourage students to study, explore and engage with other cultures—to broaden their perspective and involvement in the world. UC Santa Cruz students have many options for study global learning.

UC Santa Cruz students have many opportunities to study abroad or away. UC Santa Cruz Global Learning programs include:

- UCSC Global Seminars: UCSC courses taught by UCSC faculty abroad in the summer, coordinated by UCSC Global Learning.
- UCSC Exchanges: Immersion programs at institutions abroad, coordinated by UCSC Global Learning.
- UCSC Global Internships: Explore career goals, expand your professional network, and gain work experience either abroad or virtually, coordinated by UCSC Global Learning.
- UCSC-APRU Virtual Student Exchange: Enroll in one online academic course offered by a participating APRU member institution, as a complement to a full-time course load at UCSC.
- UCSC Global Classrooms: Collaborative online international learning while enrolled in an existing UCSC course, integrating project-based learning in collaboration with a classroom at a partner institution.

UC Santa Cruz students can also explore other UC and non-UC study abroad or away options, including:

- UCDC: Academic internship program in Washington DC, coordinated by a central UC systemwide office for all 9 undergraduate campuses
- UC Education Abroad Program (UCEAP): UC study abroad provider for all UC campuses.
- Other UC Study Abroad: Varying types of study abroad and away programs, coordinated by other UC campuses' study abroad offices
- Independent Programs: Varying types of study abroad and away programs, coordinated by organizations outside of the UC system.

UC Santa Cruz Global Learning is available to assist UCSC students with program selection, application process, and academic planning. Students are encouraged to explore their options and plan for a global learning experience early in their

UCSC career. Visit the UCSC Global Learning website to get started.

International Scholar and Student Services

The International Scholar and Student Services (ISSS) office provides immigration advising and advocacy as well as cultural and academic programming for UCSC's growing global community. ISSS assists students, scholars, researchers, and faculty members in maintaining their legal status while in the United States, serving as UCSC's official liaison to U.S. government agencies related to immigration matters. ISSS serves more than 1,000 international clients and their accompanying family members who come to the campus each year.

Global Programming

Global Programming designs and facilitates orientation programs, events, and activities, for international undergraduates, graduate students, and scholars to foster increased intercultural learning, to build community, and to support cultural adjustment. Global Programming supports the study abroad team by assisting with pre-departure orientations and re-entry programming for study abroad students, administers a mentorship program for first-year international students that serves as leadership development for the mentors, and offers international/intercultural events open to all, such as programming during International Education Week.

Global Initiatives

Global Initiatives manages and tracks UCSC's growing portfolio of international partnerships and works with UCSC faculty and academic departments as well as institutions abroad to identify potential partnerships and develop agreements that support student and faculty international mobility, research, and recruitment. Working across the division and with academic and support units throughout campus, Global Initiatives also facilitates implementation of a variety of new and special programs led by the division, and provides communications planning and data analysis in support these initiatives.

Support for Graduate Study and Research Abroad

The Division of Global Engagement administers the application process for the Prestigious International Postgraduate Scholarships (PIPS) described below. Most of these awards require a campus endorsement before the applications can be forwarded to the final levels of competition.

To help students prepare competitive applications the assistant director for Sponsored Student Programs offers individual advising and occasional workshops on selecting recommenders, preparing compelling personal statements, interviewing, and developing project proposals or proposed programs of study.

Advance preparation for these awards is essential. Eligible candidates should arrange an advising appointment with the assistant director early in the process.

Scholarship Types

- Fulbright Program
- Rhodes Scholarship
- Marshall Fellowship
- Schwarzman Scholars Program

Field and Exchange Programs

UCDC Program at the UC Washington Center

The UCDC Program supervises and supports students who pursue a quarter of academic study and internship work in the nation's capital. Internship placements are geared toward student interests, including but not limited to government and public policy, science and the environment, education and the arts, advocacy and nonprofit organizations, law, and business and finance. Students live in the UC Washington Center with students from other UC campuses, which provides an intellectual and social community throughout the quarter.

The program is open through an application process to juniors and seniors (occasionally sophomores) **in all majors**. Students enroll for fall, winter, or spring quarter, earn 12 to 17 course credits, complete an internship, and continue to be registered as full-time students. Applicant selection is based on academic record, a written statement, letters of recommendation, and in some cases a personal interview. Financial-aid eligibility is maintained.

Interested students with strong academic records are encouraged to apply. For further information, visit the UCDC website or email the UCDC Coordinator at ucdc@ucsc.edu.

Intercampus Visitor Program

UCSC students may take advantage of educational opportunities at other campuses of the University of California through the Intercampus Visitor Program. This program enables you to take courses not available at Santa Cruz, to participate in special programs, or to study with distinguished faculty at other campuses.

To qualify for participation in this program, you must be in good standing after completing at least three quarters in residence at Santa Cruz. Each host campus establishes its own criteria for accepting students from other campuses as visitors. You must also have the approval of your college. Consult with your department about how courses taken at the host campus may apply to your major requirements.

Applications are available at the Intercampus Visitor Program website. Additional information is available from the special programs coordinator in the Office of the Registrar, (831) 459-

4412. The application form contains a great deal of useful information about the program and how and when to file; please read it carefully. A nonrefundable application fee of \$70 is due when the application is filed.

Cross-Campus or Simultaneous Enrollment with Other University of California Campuses

Undergraduate students enrolled at UCSC may enroll, without formal admission and without payment of additional university fees, in courses at another UC campus on a space-available basis at the discretion of the appropriate campus authorities on both campuses. Simultaneous enrollment refers to UC courses not offered through UC Online. Additional information about online UC courses is available through UC Online.

Currently registered students must meet all of the following requirements to be eligible to enroll in one class through the Cross-Campus and Simultaneous Enrollment Programs: completion of a minimum of 12 credits at UCSC as a matriculated student, be in good academic standing, and demonstrate appropriate academic preparation as determined by the host campus. Full-time students must be enrolled in at least ten credits at UCSC. University Part-Time students must be enrolled in at least five credits at UCSC and may enroll in up to ten credits total.

Information about Cross-Campus Enrollment is available through UC Online. Applications for Simultaneous Enrollment are available at the Office of the Registrar, 190 Hahn Student Services Building or online. For more information, call (831) 459-4412 or email registrar@ucsc.edu, or visit the website at Simultaneous Enrollment.

Part-Time Program

If you are unable to attend the university full-time because of family obligations, employment responsibilities, or a medical condition, or you are in your final quarter before graduation, you may qualify for the Part-Time Program. This program enables students to pursue a bachelor's degree part-time in any major offered at UC Santa Cruz. To participate, undergraduate students must file a Part-Time Program application by the appropriate deadline. Full-time students normally take three 5-credit courses per quarter; part-time students may enroll in a maximum of 10 credits.

Students approved for enrollment on a part-time basis pay the same fee as full-time students but pay only one-half of the tuition. Part-time nonresidents pay one-half of nonresident tuition. Financial aid awards may be affected by enrolling part-time. Students who use the part-time fee reduction may not also use the UC employee reduction. Part-Time Program applications are submitted online to the Office of the Registrar. For more information, call (831) 459-4412, or email registrar@ucsc.edu. More information is available on the Part-Time Program website.

Domestic Exchange Programs

UCSC has exchange programs with the University of New Hampshire (UNH) and the University of New Mexico (UNM).

UNH is located near the New Hampshire seacoast in the picturesque colonial town of Durham, a little more than an hour from Boston, Massachusetts. UNM is located in Albuquerque, a city of approximately half a million population, situated on the banks of the Rio Grande. Both schools give students the opportunity for an educational experience in an entirely different environment.

While enrolled in the exchange program, students maintain their status at UCSC, and they are expected to return to complete their studies following enrollment at UNH or UNM. Both universities are on the semester system and students may participate in one semester or the entire academic year.

Participants are selected from among students who are in good academic standing. Successful applicants will be expected to confirm their participation at the beginning of spring quarter. Each department of study determines the applicability of UNH and UNM courses toward requirements for the major. Letter grades earned while at UNH and UNM will not be calculated into the UCSC GPA or the UC GPA. Further information is available from the exchange program coordinator in the Office of the Registrar, by phone at (831) 459-4412, and at the Domestic Exchange Programs website.

Intersegmental Cross-Enrollment

This program permits a student who is currently enrolled in a California community college or a California State University campus and who meets certain eligibility criteria to enroll in one undergraduate course at UCSC each term, on a space-available basis. A student is qualified to participate in this program if he or she meets the following requirements:

- has completed at least one term at the home campus as a matriculated student and is enrolled in at least 6 credits at the home campus during the term in which he or she seeks to cross-enroll;
- has a grade point average of 2.0 for work completed;
- has paid tuition or fees required by the home campus for the academic term in which he or she seeks to cross-enroll;
- has appropriate academic preparation as determined by the host campus, consistent with the standard applied to currently enrolled students;
- is a California resident for tuition purposes at the home campus; and
- has not previously been admitted to and registered at UCSC.

Applications are available online. The application form contains a great deal of useful information about the program and how and when to file. Please read it carefully.

Field Programs and Internships

Many UC Santa Cruz students complement their major programs with field experience or internships, which also provide opportunities to become involved in public service

activities in the local community and throughout the world. Most of the field programs described below are open to students in a range of majors, although some are restricted to students pursuing a designated area of study. Students in all majors may apply for internships sponsored by the Career Center.

In addition to the off-campus placements provided by the programs described below, independent field study opportunities are available through some UCSC colleges and departments.

Chancellor's Undergraduate Internship Program (CUIP)

The Chancellor's Undergraduate Internship Program (CUIP) provides on-campus internships in programs and departments throughout UC Santa Cruz. Interns work with a mentor to develop personal and professional skills and take a leading role in producing projects. A two-unit leadership seminar class is required for fall, winter, and spring quarters. A scholarship of \$8,200 is paid toward the intern's registration fees for the academic year.

Community Studies Field-Study Program

Community Studies is the oldest interdisciplinary undergraduate degree program at UCSC. Its hallmarks are a focus on social justice and a distinctive pedagogy that integrates classroom learning and an extended six-month field study. Not only is the full-time field study a requirement of the major, it is the centerpiece of a core curriculum through which students prepare for, then immerse themselves in a setting where they participate in and analyze the social justice work of an organization. Upon return from field study, students integrate topical and experiential learning in a capstone project (usually a senior essay) that uses their field notes as a key source for analysis.

With the guidance of faculty and staff advisers, community studies students choose field placements related to one of the program's areas of focus in economic justice and health justice. Placements have included community health clinics, women's and feminist organizations, immigrant-rights centers, media and policy advocacy organizations, homeless resource and support groups, sustainable development projects, queer and transgender organizations, neighborhood or workers' collectives, civil rights groups, community food security programs, legal clinics, community-based cultural organizations, programs for seniors, tenant or labor unions, HIV/AIDS advocacy groups, harm reduction programs, government agencies and the offices of elected officials, and many other organizations committed to working for social justice. As political, economic, cultural and technological landscapes shift, so do the needs and opportunities for social justice organizing. Throughout its history Community Studies has been noteworthy for being attuned and responsive to innovative in field-study opportunities in a changing world.

The practical experience gained from the six-month field study, combined with their topical learning, provides graduates with many choices. About half go on to graduate or professional study in education, urban studies, public health, public

administration, social work, planning, law, policy studies, medicine, nursing, or academic disciplines like sociology, anthropology, and politics. Others enter the work world directly, in many cases continuing with non-profit agencies like those in which they did their field study. Community Studies graduates are social entrepreneurs, community organizers, program directors, public officials, teachers, therapists, librarians, social workers, news directors, union officials, labor organizers, forest management consultants, reporters, youth workers, and artists. According to a recent alumni survey, almost 100 alumni have founded nonprofit social justice organizations, and many more have served on nonprofit boards and/or in executive director positions.

The field study program is open to Community Studies majors only. The entire major usually takes two years to complete. For more information, see the Community Studies website.

Economics Field-Study Program

The Economics Department offers its majors the opportunity to integrate their academic knowledge with career-related work. The field-study program places students in internships under the supervision of a faculty sponsor and a professional in the workplace. Students can select from a wide variety of field placements such as accounting firms, community nonprofits, government agencies, brokerage firms, marketing agencies, banks, and businesses in Santa Cruz and beyond. Students apply and prepare for field study a quarter in advance. Acceptance into the field-study program is determined by academic standing, class level, and successful completion of Economics 100A, 100B, and 113 (see Economics courses (p. 898)). Students may earn a maximum of 10 credits and complete up to two quarters in a field placement.

Along with the training and supervision by a professional in the workplace, students receive guidance from a faculty sponsor who directs their academic project. Completion of this project and the job supervisor's evaluation of performance earn the student credit. Economics Field Study (Economics 193 or 198, see Economics courses (p. 898)) does not satisfy an upper-division requirement for the major and is available on a passing/not passing (P/NP) basis only.

Further information is available from the Economics Field Study Office, 402 Engineering 2 Bldg.; by phone at (831) 459-5028; or by email at econintern@ucsc.edu.

Environmental Studies Field and Internship Program

Open to all UCSC students, the Environmental Studies Field and Internship Program is an integral academic component of the environmental studies major, and it augments the research and professional development of undergraduate students (see Environmental Studies). Interns are placed, individually and in groups, in both on-campus and off-campus agencies, where their work often results in publications and resource documents, and in many cases serves as the primary basis for policy formation within a particular agency or organization. Placements have included research for small businesses; learning all aspects of running an organic farm; writing policy

documents for state agencies, nongovernmental organizations, and planning departments; assignments as natural history interpretive guides for state and national parks; and apprentice positions with consultants, architects, solar-energy designers, agroecologists, and teachers. Student intern placements are also obtainable working with coffee growers, teachers, and agricultural specialists in Costa Rica, Nicaragua, El Salvador, and Mexico.

Part- and full-time placements are available, and students may receive two to 15 course credits for their work. Each student's placement is supervised by a team of supporters: a faculty adviser, field sponsor, and the internship coordinator. Students spend 12 to 15 hours each week on their assignments for every 5 credits they receive.

Internships and fieldwork are designed to complement a student's coursework and are available for both lower- and upper-division credit. Often, the internship leads to a summer job or employment after graduation. Qualified environmental studies majors may undertake a senior internship to fulfill the department's comprehensive requirement. In addition, internships provide a fieldwork component for some environmental studies courses. Undergraduates are also afforded ample opportunities to intern on faculty and graduate-student research projects.

Further information is available from the Environmental Studies Field and Internship Program Office, 491 Interdisciplinary Sciences Building, (831) 459-2104, email: ckrohn@ucsc.edu. More information is available at envs.ucsc.edu/internships.

The Everett Program (formerly the Global Information Internship Program)

The Everett Program is focused on connecting the university to community partners on a global scale. It supports social change using the tools of technology, social entrepreneurship, and research.

The Everett Program recruits highly motivated and innovative students who are committed to developing social enterprises and contributing to social justice and environmental sustainability movements at the global and local levels. The program consists of three quarters of rigorous classes, practical technology labs, and project labs. It empowers students to focus their passion for social change by teaching them how to research, plan, design, fund, implement, and evaluate projects in collaboration with community change agents, using information and communication tools. Students are supported and encouraged to participate in outside-of-class trainings, competitions, outside grants, and opportunities to connect with the Everett alumni network.

Everett-sponsored students have worked with Muslim feminists in Malaysia, coffee farmer co-ops in Central America, democracy-advocating NGOs in Ghana, and aspiring high school students in Watsonville. For more information, see www.everettprogram.org. As managers of the program, past students who have become Everett Fellows also facilitate peer-to-peer technology and project labs throughout the year. These focus on training students in valuable skills such as participatory mapping, website and graphic design, digital video

storytelling, social media campaigns, and robotic programming. The Everett Program's year-long series is interdisciplinary and counts as an upper-division elective for several social science majors. It also serves as a foundation for the major and minor in global information and social enterprise studies (GISES), which is sponsored by the Department of Sociology. For more information on the GISES and Intensive Sociology major and minor, please see Sociology Department Majors and Minors.

Fieldwork in Education Programs

The M.A. in Education/California SB 2042 Preliminary Teacher Credential program provides students with necessary credential preparation for K–12 teaching in the California public schools. Preparation is offered for the Multiple Subject Preliminary credential (typically Grades K–6), and the Single Subject Preliminary credential (typically Grades 7–12) in the following subject areas: English, math, social science, and science. Credential students may also pursue a Bilingual Authorization in Spanish. Students pursuing the Education M.A./California Preliminary Credential must complete a three-quarter student teaching course sequence. Student teaching placements are restricted to enrolled students. The student-teaching sequence consists of five courses: Education 200, 201, 202A, 202B, and 202C. Fall and winter quarters of the sequence involve part-time placements in public schools in Santa Cruz County, Monterey County, and Santa Clara County. Spring quarter is a full-time experience in which student teachers take over full responsibility for the daily instructional program of the classroom in which they are placed. Substantial fieldwork in K–12 classrooms is also incorporated in other courses required for the teaching credential.

The minor in education is an undergraduate program in which students explore the history of educational thought and philosophy; the politics and economics of education, learning theory, and pedagogy; and issues of cultural and linguistic diversity related to schooling. As a part of the six-course minor sequence, students engage in field study in local schools through Education 180, Introduction to Teaching.

For more information, contact the Education Department, 1280 McHenry Library Building, (831) 459-4102, or education@ucsc.edu.

Health Sciences Internship Program

A requirement of the Human Biology major, the Health Sciences Internship Program offers students a unique opportunity for personal growth and professional development. Paired with a professional mentor, students spend one quarter interning in a health-related setting. Placement opportunities cover a broad range, from individual physicians to community clinics and hospitals, hospices, non-profits, and public health agencies. The Health Sciences Internship coordinator works with students to prepare them for their internship and maintains a list of appropriate placements. Junior and senior human biology majors only are eligible to apply. Applications are due two quarters in advance. For further information, contact the Health Sciences Internship Coordinator, Caroline Berger, at (831) 459-5647 or cberger@ucsc.edu.

Latin American and Latino Studies Field-Study and Internship Opportunities

All Latin American and Latino Studies majors are strongly encouraged to undertake either (1) a field study in Latin America, the Caribbean, or a Latino/a community in the U.S.; or (2) formal academic study abroad through the UC Education Abroad Program (UCEAP). These paths are the best ways to improve language skills, explore the nature and direction of specific academic and career interests in relation to Latin American and Latino studies, and deepen cross-cultural understanding and relationships based on personal experience.

Field studies comprise independent, community-based study projects for academic credit, done under faculty sponsorship and arranged on an individual basis. Students can do full-time field study for one quarter for full academic credit, part-time field study scheduled in conjunction with formal coursework at UCSC, or field study as an extension of the UC Education Abroad Program (UCEAP). Projects vary widely, but students who want to develop a field-study proposal are expected to prepare for it by acquiring fluency in the appropriate language, prior cross-cultural experience, and upper-division coursework on the region and/or topic that is to be the focus of the study.

Students who wish to pursue a full-time field study are advised to speak with their faculty advisor to assess their eligibility and preparation, as well as to receive needed guidance, ideally a quarter or two in advance.

Many of the students who have done full-time field study have developed a senior thesis based on that work. Students who pursue a part-time field study are highly encouraged to discuss their plan with their faculty advisor as well.

Local opportunities for internships and field study in Latino/a communities on California's Central Coast are numerous. Credit for up to three upper-division courses may be applied toward the major from field study; however, course credit from field study and study abroad combined may not exceed three upper-division courses. Students should check the Latin American and Latino Studies Department website for further information regarding the field-study process and course credit. A listing of local field-study programs and petition forms are available at the LALS Department office, 32 Merrill Academic Building.

For more information, contact the LALS office at (831) 459-2119 (aalvares@ucsc.edu).

Psychology Field-Study Program

The Psychology Field-Study Program provides qualified students an opportunity to integrate what they have learned in the classroom with direct service to a community agency. Each year, more than 200 students develop new skills and clarify personal and professional goals by working as interns in schools, criminal justice programs, and mental health and other social service agencies, where they are supervised by a professional within that organization. Psychology faculty members sponsor field-study students, helping them to synthesize their intern experience with psychology coursework and guiding them through an academic project.

Junior and senior psychology majors in good academic standing are eligible to apply for this competitive program. **There is a minimum commitment of two quarters.** Interested students should attend an information meeting, held every quarter, for a general overview and application. The schedule for each quarter is posted at the start of instruction. For more information, visit the Psychology Field Study Program website.

University of California Center Sacramento

The University of California Center Sacramento offers students a chance to spend a quarter fully immersed in legislative and/or community service programs in the state capital. Students intern a minimum of 24 hours per week in the Assembly, Senate, Governor's Office, and with state agencies and nonprofit organizations. They also enroll in related courses taught at the UC Sacramento Center one block from the Capitol Building. Students live with other UC campus participants in a living and learning community. This opportunity is available to students from any major and is open to undergraduate and graduate students. For information, see the UCSC Career Center website.

The University of California Center Sacramento offers students a chance to spend a quarter fully immersed in legislative and/or community service programs in the state capital. Students intern a minimum of 24 hours per week in the Assembly, Senate, Governor's Office, and with state agencies and nonprofit organizations. They also enroll in related courses taught at the UC Sacramento Center one block from the Capitol Building. Students live with other UC campus participants in a living and learning community. This opportunity is available to students from any major and is open to undergraduate and graduate students. For information, see the UCSC Career Center website.

Summer Session Courses and Programs

UCSC Summer Session offers UCSC students a chance to accelerate progress toward their degrees and welcomes visitors from other colleges and universities as well as members of the community (including high school juniors and seniors). A broad range of 250 courses are taught by UCSC faculty, lecturers, and graduate students. Often significantly smaller in size than during the fall, winter, and spring quarters, Summer Session classes include major requirements and qualifying courses, lower- and upper-division courses, general education courses, and online courses. Most are five weeks long. Students may enroll in multiple classes in one or all of the sessions, with a maximum of 30 credits total.

Tutoring, advising, and other academic and personal support is available, as are on-campus housing and dining, OPERS fitness center and outdoor recreation, campus employment, and more. Many course restrictions are lifted in summer, giving students new opportunities. Special summer-only programs include the Summer Academies for new fall admits and the renowned one-week Dickens Universe. Please visit summer.ucsc.edu for courses and details or email summers@ucsc.edu.

UCSC Silicon Valley Extension

In April 2016, UCSC Extension opened its doors to the UC Santa Cruz Silicon Valley Campus. Located at 3175 Bowers

Avenue in Santa Clara, the Silicon Valley Campus is a beautiful new facility outfitted with the latest educational technologies just a stone's throw from the Santa Clara Square. UC Santa Cruz undergraduates and graduate students, as well as community members seeking continuing education, have their choice of certificate programs in more than 40 disciplines and services designed to meet the needs of Silicon Valley and greater Bay Area.

UCSC Extension provides professional training that reflects the academic rigor of the University of California and the hands-on, roll-up-your-sleeves practicality of Silicon Valley culture. Developed with guidance from key industry leaders and academic experts, UCSC Extension's certificate programs match the demands of a wide range of industries, including engineering, business, education, bioscience, and environmental safety. The Silicon Valley Campus is also home to the University of California Scout program, graduate programs affiliated with UCSC's Baskin School of Engineering, and an English language school designed to equip English language learners with the skills necessary to accelerate learning or take the next step in their careers.

Extension's career-oriented programs cover the latest best practices, tools, and technologies in engineering and technology, business and management, applied and natural sciences, and education. While most certificates can be completed within one year, coursework is graded and substantial, typically involving lectures, readings, presentations, and final projects or examinations.

Extension also has a robust international department, English language program, and Optional Training Program (OPT), and offers F1 visa guidance and internship opportunities.

Regularly enrolled UCSC students may obtain degree credit for Extension courses numbered 1–299. Lower division courses are numbered 1–099, upper division offerings are 100–199, and graduate-level courses are 200–299. Upon submission of the Extension transcript to the Office of Admissions, the course credit may be applied toward a bachelor's degree at UCSC. Many Extension courses are recognized for graduate degree credit by other universities (acceptance of course credit is based upon approval by the accepting university).

Students can study in a few different ways: in classrooms or labs at our Silicon Valley location; online, via our dynamic learning platform; and in hybrid courses, which offer a combination of classroom meetings and online learning. Many courses have both online and classroom sections available each quarter to ensure that students with commutes, jobs, and family obligations can find courses that fit their schedules.

Visit UCSC Extension or call (408) 861-3700 to enroll or to learn more about courses and programs.

Open Campus/Concurrent Enrollment

Concurrent Enrollment Through Extension is a cooperative arrangement between UC Santa Cruz and UCSC Silicon Valley Extension that enables members of the public to enroll in one or two regular UCSC undergraduate or graduate courses per quarter for credit. The program is administered by UCSC

Silicon Valley Extension, and course credit granted appears on a UCSC Silicon Valley Extension transcript. Participants must meet certain criteria outlined in the Concurrent Enrollment application. An application fee is charged for each quarter of enrollment in addition to course fees. A first-time application fee of \$110 applies.

Concurrent Enrollment through Extension may be used as a path toward a part-time or full-time degree program or as a way of studying subjects of personal or occupational interest. Credit earned through this program may be used toward degree requirements, when applicable, if participants subsequently seek admission to the university and are accepted.

Financial aid is not available to participants in the Concurrent Enrollment program.

For further information and to obtain an application packet, contact UCSC Silicon Valley Extension, 3175 Bowers Ave., Santa Clara, CA 95054, (408) 450-4920, or email opencampus@ucsc.edu.

THE COLLEGES AND STUDENT LIFE

In this section:

The Colleges

About UCSC's Colleges

UC Santa Cruz combines the resources of a world-class public research university with a distinctive undergraduate experience characterized by our college system. Each college is a vibrant living/learning community supported by enrichment courses, advising and academic support, and faculty and staff who organize student activities and sponsor events to enhance the intellectual and social life of the campus. The colleges are committed to fostering a nurturing and academically thriving environment for students of all backgrounds. Each college strives to promote the attributes of a diverse and multicultural community in its own unique way.

In order of founding, the colleges are Cowell, Stevenson, Crown, Merrill, Porter, Kresge, Oakes, Rachel Carson College, College Nine, and College Ten. Self-contained and architecturally distinct, each college is a relatively small community of 30 to 110 faculty members and between 1,500 and 1,800 students, about half of whom live on campus. Each college has its own housing, as well as academic and recreational programming, and each is an integral part of the larger campus. The colleges have their own academic emphases and cultural traditions, although each seeks faculty and students from a variety of disciplines to foster broad intellectual interests. The colleges play a primary role in academic advising and are the center of student life. Students graduate from their college. At the same time, all university academic programs, resources, and student services are open to students of every college.

All undergraduate students are affiliated with one of our 10 colleges, their home within the larger university. During the

process of accepting the offer of admission, entering students are asked to list several colleges in order of preference; whenever possible, students are assigned to one of their preferred colleges. The information students need to rank their college preferences can come from a variety of sources—personal acquaintance, a campus visit, literature available from the colleges, campus websites, and the descriptions in this section of the catalog. Students also have the option to indicate “no preference,” meaning they will be fine with any of our 10 colleges, and the Admissions Office will assign those students to one of the colleges.

Similarities and Differences

The colleges are small-scale residential communities, each providing an academically and socially supportive environment and offering special programs designed to help students transition to campus life, build a strong connection with the campus, and get the most out of their UCSC experience.

Each college provides academic advising as well as academic and general campus orientations to help you plan your academic program. College academic preceptors and advisers provide advice on general academic matters outside a student’s major, including general education, choosing a major, and strategies for academic success. Psychological and personal counseling is also available in each college. The faculty, or fellows, of each college come from a variety of academic disciplines; many faculty have their offices in the colleges.

Each college offers a distinctive academic core course for entering frosh. The required course provides a significant bridge between academic and residential life, since all frosh, regardless of major, will be in the course, and most will be in residence as well. The colleges also offer selected courses in their area of interdisciplinary emphasis and host events and speakers that enhance this focus.

Architecturally distinct, each college was planned by a different architect who was encouraged to convey the distinct personality of that college through the design of its buildings and their placement in the natural environment. The particular style of housing varies among the colleges, ranging from residence halls, with a mix of shared and private rooms, to apartment-style housing, where students live together in small groups and may do some of their own cooking. Each college’s residential program is a team effort. Live-in student and professional staff members provide orientation and support services, organize activities and events, provide referral information about academic or personal concerns, and assist with roommate problems.

Changing Colleges

Most students develop friendships and intellectual attachments within their affiliated college, and remain members of that college throughout their undergraduate years. Some students find that changing academic interests draw them to a different college. During specified filing periods, students may request a change of college with the approval of both college administrations.

Cowell College

Cowell College inaugurated the Santa Cruz campus when it opened with a pioneer class of 600 students in 1965. The founding faculty shaped an educational program that challenged and enriched students through wide-ranging inquiry and disciplined study. Today, Cowell has more than 1,500 affiliated students and over 90 faculty fellows. Its motto—The Pursuit of Truth in the Company of Friends—expresses a continuing commitment to create a serious academic environment within a humane and broadly inclusive community. The college is named for the S. H. Cowell Foundation, which endowed the college at its founding.

ACADEMIC EMPHASES

The academic theme of the college encourages students to pursue their general and disciplinary study with attention to the values of liberal arts education: understanding one’s individual perspectives by exploration of one’s historical background and world context. Students affiliated with the college pursue majors from all departments on campus.

Additional information about Cowell College academics, including Core Course requirements and other academic programs, is available here. (p. **Error! Bookmark not defined.**)

COLLEGE COMMUNITY AND FACILITIES

UC Santa Cruz combines the resources of a world-class public research university with a distinctive undergraduate experience characterized by our college system. Each college is a vibrant living/learning community supported by enrichment courses, advising and academic support, and faculty and staff who organize student activities and sponsor events to enhance the intellectual and social life of the campus. The colleges are committed to fostering a nurturing and academically thriving environment for students of all backgrounds. Each college strives to promote the attributes of a diverse and multicultural community in its own unique way.

Arranged around the college’s central courtyard are the dining hall, the Page Smith Library, the Mary Holmes Fireside lounge, the Cowell Coffee Shop: For the Peoples, and conference room and classrooms. The Cowell Press, where students can learn the fine technique of hand-operated letterpress printing, is a stone’s throw away from the plaza. Also nearby is the Eloise Pickard Smith Gallery, including the Ann Dizikes Annex.

Since the college’s founding, regularly scheduled College Nights in the dining hall have offered students, staff, and faculty a special meal and a rich mix of programs. Community life is enlivened by many other scheduled and impromptu intellectual, cultural, and social events.

The Cowell Senate meets weekly to discuss campus issues and student government. The Senate advises the college on the allocation of funds for student activities and programs. Members of the Senate are selected each year by lot, but any student may become a voting member by steady attendance at

meetings. The college's student groups, staff, and faculty work together to create a supportive community for students from all ethnic groups, all religious traditions, and all sexual orientations and to increase awareness of the many dimensions of diversity in the community.

For more information on the college, see the Cowell College website or call (831) 459-2253.

COWELL FELLOWS AND STAFF

Cowell College faculty fellows are listed on the college's faculty directory.

College staff are listed on the college's staff page.

Stevenson College

Stevenson College is named after former statesman and U.S. Ambassador to the United Nations Adlai E. Stevenson. Our faculty, students, and staff take pride in intellectual critical inquiry, academic and civic leadership.

Stevenson College has a long-standing reputation for excellence in liberal education. The college strives to provide an academically, culturally, and socially supportive environment for all its members, fostering social responsibility and academic achievement. Stevenson alumni can be found in legal, political, educational, engineering, medical, computer and information sciences, business, and public administration careers, among others.

The college's faculty and staff offer professional and personal service for the diverse needs of students. Faculty and staff assist students in all areas of their academic and social experience at Stevenson College, and are committed to instilling respect for the diverse backgrounds of Stevenson students.

ACADEMIC EMPHASES

The faculty at Stevenson, drawn from a variety of disciplines in the social sciences, humanities, and physical and biological sciences, share a common concern for the study of social processes that shape modern society and determine the quality of our individual lives throughout various global regions and periods of world history.

Additional information about the Stevenson College academics, including Core Course requirements and other academic programs, is available here. (p. **Error! Bookmark not defined.**)

COLLEGE COMMUNITY PROGRAMS

- College Nights
- Stevenson Student Council
- Social and Multicultural Programs/Activities
- Cultural Arts and Diversity Rainbow Theater

- Stevenson Finals Study Breaks at the Provost House

Stevenson holds regular College Nights, a long-held tradition where Stevenson faculty, staff, and students get together for a special, themed dinner followed by entertainment.

The Stevenson Student Council meets weekly. This group is responsible for allocating college membership fees to student activities. The council also serves as a forum for the discussion of college and campus-wide issues and appoints student representatives to college and campus-wide committees. Students have a wide variety of opportunities to engage with interactive and meaningful programs and activities outside the classroom.

Facilities

- Eight small residence halls, three of which are themed houses:
- LGBTQIA+
- Diversity and Social Justice House
- The Rosa Parks African American Theme House (R. PAATH)
- Three apartment buildings
- Stevenson Coffee House
- Wagstaff Fireside Lounge
- Writers' Center
- Stevenson Library
- Stevenson Event Center
- Silverman Conference Room
- Recreation Room
- Stevenson Garden
- Stevenson Music Practice Rooms

Stevenson has a wide variety of facilities and activities to appeal to many tastes. The college, designed by San Francisco architect Joseph Esherick, has won many architectural awards. The buildings are situated amid redwood trees and sprawling lawns, and the main quad overlooks Monterey Bay. Stevenson is situated close to the campus bookstore, restaurants, McHenry Library, gym, and pool. There are eight small residence houses at the college providing a choice of single-gender or mixed-gender floors; each house accommodates about 90 undergraduates. The apartments provide space for continuing students. Nearby are a picnic area, playing fields, and a garden. Stevenson is also the home of the Rosa Parks African American Theme Housing (R.PAATH), which is a student-initiated living-learning space for students whose interests span historical, present-day, and future experiences of predominantly African American, Black, and Caribbean peoples.

The Stevenson Coffee House, which has become the gathering place in the college, is a friendly and inviting spot to enjoy lunch or an espresso and pastry—indoors or out on the patio. It is the scene of lively conversation, occasional musical entertainment, and chess matches. Adjoining the Coffee House is the recreation room, with Ping-Pong, a pool table, and televisions. This area is also the site of much socializing and spontaneous group activity.

In contrast, the Stevenson Library is a striking building designed for quiet reading and study. The Wagstaff Fireside Lounge, a retreat for relaxed discussion, is also used for recitals, special lectures, meetings, and residence house activities. Art exhibits (both student and professional) are on display throughout the year in the lounge, library, and coffee house.

For more information on the college, see the Stevenson College website or call (831) 459-4930.

STEVENSON COLLEGE FELLOWS AND STAFF

Stevenson College faculty fellows are listed on the college's faculty directory.

Stevenson College staff are listed on the college's staff page.

Crown College

Crown College seeks to provide our students with a living and learning environment in which they can positively develop intellectually and socially. Crown is traditionally viewed as the “science college,” and the majority of our affiliated faculty fellows teach in the STEM (Science, Technology, Engineering, and Math) fields. However, half of our students major in the social sciences, arts, and humanities.

Crown is located on a hilltop surrounded by a redwood forest. The core buildings consist of an administration office, dining commons, lounge spaces, study spaces, faculty offices, and classrooms built around a large patio and central fountain. The award-winning architecture with its white walls and high-pitched tiled roofs suggests a hillside Mediterranean village. The college's residential facilities house approximately 800 students. The facilities at Crown College were built through a partnership of public funds and a gift from the Crown Zellerbach Foundation.

ACADEMIC EMPHASES

From the time of its founding in 1967, issues pertaining to the role of science and technology in society have been a focus of special interest at Crown College. We approach these issues from an interdisciplinary perspective that recognizes the influence of social and cultural factors on the scientific enterprise, as well as the ways in which science and technology influence our society. Complementing its focus on science and technology, Crown also supports innovation and experiential learning through classes and funding opportunities.

CRWN 1, Academic Literacy and Ethos: Ethical and Social Implications of Emerging Technologies

Offered fall quarter

Crown College's entering frosh enroll in our core course, CRWN 1, which explores the theme, Ethical and Societal Implications of Emerging Technologies. Students work individually, in small groups of four to five students, and in sections of 25 to 30 students, thereby modeling and embracing the diversity found across campus. CRWN 1 looks at how technologies transform our society, the agents driving technological development and what the generalized adoption of emerging technologies is leading to. CRWN 1 also explores the ethical dilemmas involved and what we can do as responsible citizens to address the challenges facing our society. Deeper goals of this course include fostering a sense of belonging, and ensuring that our students achieve college-level reading, critical thinking, and effective communication skills.

A central component of the course is a group research project, in which students study the impact of a technology of their choice, while learning strategies for effective group work. The core course is enhanced through our plenary series, which gives students opportunities to meet intellectual leaders and hear them speak in the intimacy of the provost's house. We also organize a science fiction short story contest, and students are encouraged to attend and/or present at Crown's Social Fiction Conference and have the opportunity to enact a play connected to the impact of technology by taking a drama class offered in winter.

Other Academic Programs

Crown has programs that support innovation, the cultivation of transferable skills, and experiential learning. On the innovation front, Crown offers entrepreneurship and social entrepreneurship classes, supports the Student Creativity and Entrepreneurial Empowerment club, and Crown facilitates interested students to access to incubator space and funding opportunities through its partnership with the Center for Innovation and Entrepreneurial Development. Crown also offers a Sci Fi class and sponsors a Sci Fi short story contest. To support transferable skills, Crown offers classes in broadcasting, in digital storytelling, in podcasting, and in computer modelling of human behavior or biological systems. Finally, Crown promotes experiential learning by providing funding to support student class or research projects as well as

internships in Crown's Center for Applied Ethics and Values and in our GetVirtual project <https://news.ucsc.edu/2020/05/getvirtual.html>.

Crown is one of the colleges hosting the College Scholars Program, which provides a congenial and challenging academic home for a select group of well-prepared students at UC Santa Cruz. This enriched program of study includes special courses, seminars, colloquia, and other events in the fall of the sophomore year. Admission to the College Scholars Program can be by invitation during the admissions process based on high school academic performance (early entry) or in winter of the freshman year based on academic potential shown during the first quarter at UCSC (late entry).

College Advising

Crown Advising is located in the Crown Administration Building and is staffed by the college assistant, professional academic advisers, and peer advisers. Crown Advising offers drop-in advising and appointment advising (phone or in person) every weekday in fall, winter, and spring terms. Summer advising is by appointment only (phone or in person). To schedule an appointment, students should use Slug Success (<https://ucsc.campus.eab.com>) For quick questions or completion of most forms, students are encouraged to email crownadvising@ucsc.edu. Please visit our website for the most up to date information about adviser availability.

crownadvising@ucsc.edu

Phone: 831-450-2665

Crown College Administration Building

CROWN FELLOWS AND STAFF

Crown College faculty fellows are listed [on the college's faculty directory](#). Crown College Core faculty instructors are listed on the college's Core Course Faculty page: [Core Course Faculty page](#). Crown College staff are listed [on the college's staff page](#).

[Additional information about Crown College academics, including Core Course requirements and other academic programs, is available here.](#)

COLLEGE COMMUNITY AND FACILITIES

Crown sponsors a wide variety of co-curricular events spanning cultural, educational, and social areas of interest. One popular series is the Science/Public Affairs Tables, informal dinners at the Provost House offering students an opportunity to socialize with a faculty member outside the classroom and learn about their research interests.

Students become involved in Crown life by both initiating and participating in a wide range of activities. Social activities vary each year according to the interests of students. Typical events include College Nights, themed dinners with special menus and entertainment that are open only to the Crown community; dances, including the Glow Dance and the Crown/Merrill Semi-Formal; and study breaks and stress relievers. Unique to Crown, and a collaboration between student and academic life, the

Social Fiction Conference examines issues of social justice in the ever-changing context of science fiction, fantasy, gaming, and anime.

Outdoor activities organized by the student senate, the College Programs Office, or residential staff range from whale watching on the Monterey Bay to visiting the Exploratorium in San Francisco, and from backpacking to stargazing.

Crown Student Senate (CSS), the elected student government at Crown, holds open weekly meetings to determine funding allocations for student activities and to discuss issues of concern to students and the college. CSS also sponsors events to entertain, including the very popular Casino Night.

At Crown College, we believe that the experience of living in our on-campus residence halls and apartments offers students not only support for their academic experiences, but also unique opportunities for learning about the concept of community. When college students feel connected to a community during their studies, they experience a smoother transition to university life, greater academic success, and higher satisfaction with their college experience. The Crown Residential Education team understands community not as a product we can deliver to our students, but as an experience that they are responsible for creating for and with each other. Even so, we do not ask our students to undertake this weighty task on their own. The Residential Education team partners with students, striving to be "good companions" on their journey by facilitating experiences that help them to cultivate and apply the knowledge, skills, and abilities needed to create, participate in, and lead caring and socially just communities.

Crown offers two types of residential facilities: residence halls and apartments. Eight traditional residence halls each house approximately 80 students in single and triple rooms in a coed environment (single-gender bedrooms with all gender bathrooms) or on a few all-female floors. For students interested in living and learning in a special-interest environment, Crown provides the Gaming House, Outdoor Pursuits House, and College Scholars and Science Learning Communities.

The college also has apartments for approximately 270 continuing students. Like the residence halls, the apartments are built on a small scale. Each three-story building has two or three apartments per floor that house four to six students in a combination of single, double, and triple rooms and include a kitchen, living room, dining room, bathroom, and outside deck. Other facilities in the college include the Crown Library study space; a computer laboratory with Mac workstations, which provides students with access to several kinds of systems and an array of applications and instructional software selected to support academic coursework; the Fireside Lounge with a piano and a television; and the Music Practice Room. The Crown-Merrill Community Room, with a television, pool table, foosball, and ping-pong table, provides an informal place to study or just visit with friends. Dining facilities boast continuous dining and Banana Joe's take-out and quick mart.

For general information, call the College Office at (831) 459-2665 or visit the Crown College website. For residential

information, call the Housing and Residential Education Office at (831) 459-5689.

Merrill College

Merrill College seeks to expand its students' awareness of their own heritage and of the diversity of cultures around the world, past and present. Merrill faculty specialize in a number of different areas of study, concentrating especially on social theory, international affairs, and social change, and from a variety of disciplinary perspectives including history, the social sciences, literature, and foreign language study. The college makes a special effort to be a home for students from different cultural backgrounds and for international students; it presents unique opportunities to those who value multicultural perspectives.

Merrill houses the departments of Politics, Legal Studies, and Latin American and Latino Studies. It also hosts KZSC, the campus radio station; the Research Center for Americas (RCA); UCSC's Cantú Queer Center; the student-run Pottery Co-op (the only one of its kind at UCSC); and the Ming Ong Computer Center, a computer facility with more than 40 personal computers.

ACADEMIC EMPHASIS

Cultural Identities and Global Consciousness is the ethos of Merrill College. This pairing signals the college's commitment to drawing on the "funds of knowledge" brought by individual college members to the community of scholars, and a corresponding commitment to understanding these identities within a larger global context.

Additional information about Merrill College academics, including Core Course requirements and other academic programs, is available here. (p. **Error! Bookmark not defined.**)

COLLEGE COMMUNITY AND FACILITIES

At Merrill College, we believe that the experience of living in our on-campus residence halls and apartments offers students not only support for their academic experiences, but also unique opportunities for learning about the concept of community. When college students feel connected to a community during their studies, they experience a smoother transition to university life, greater academic success, and higher satisfaction with their college experience. The Merrill Residential Education team understands community not as a product we can deliver to our students, but an experience that they are responsible for creating for and with each other. Even so, we do not ask our students to undertake this weighty task on their own. The Residential Education team aims to partner with students, striving to be "good companions" on their journey by facilitating experiences that help them to cultivate and apply the knowledge, skills, and abilities needed to create, participate in, and lead caring and socially just communities.

The Merrill Programs and Leadership Office (MPLO) and Merrill Student Government (MSG) create space for student voice and experiences to personal and academic growth and development.

Located on a hilltop between UCSC's famed Chadwick Garden and Santa Cruz's Pogonip parkland, Merrill's recently renovated, award-winning buildings thread upward through the edge of a redwood forest. Four residence halls house approximately 600 students in two high-rise structures and two smaller buildings. The Merrill Residence Halls offer a coed environment (single-gender bedrooms with all-gender bathrooms) as well as a few all-female floors and trans-inclusive housing options.

Glass curtain walls provide views from the A & B Buildings of the reconstructed college center and new restaurant building. Merrill's plaza, complete with Vivas Organic Mexican Restaurant and a large lawn, makes excellent use of the ample sunshine and provides common space for students living in the residence halls and other housing options.

The apartments, located a short distance from the central area of the college, house approximately 200 continuing Merrill students. Grouped amid winding pathways and redwood trees, these three-story buildings have two or three apartments per floor. Each apartment houses four to six students in a combination of single, double, and triple rooms, and comes fully equipped with a kitchen and a bathroom, a large living area, and an outside deck. Residents of the apartment complex share a large community room, two laundry rooms, and plenty of outdoor space.

Facilities at Merrill include the Cultural Center, where large events (including dances) take place; the Baobab Lounge, which provides study space, informal gathering space, a piano, and a television; and Casa Latina and Merrill Academic Success (MAS), which provide Merrill students with quiet places to study. Finally, at the student-run pottery co-op, students can throw, fire, and glaze their pieces in the workshop space.

The physical facilities of Merrill College were provided through a partnership of public funds and gifts from the Charles E. Merrill Trust and the family of Ming Ong, a student in the 1980s.

For more information, visit the Merrill College website or call (831) 459-2144. For residential information, call the Housing and Residential Education Office at (831) 459-5689.

MERRILL COLLEGE FELLOWS AND STAFF

Merrill College faculty fellows are listed on the college's faculty directory.

Merrill College staff are listed on the college's staff page.

Porter College

Porter College was founded in 1969 as the fifth of UC Santa Cruz's residential colleges and was later renamed in honor of a generous grant from the Porter-Sesnon family. Its mission is to

foster achievement in all areas of study. Porter is especially dedicated to achievement in the arts, believing that creative inquiry is an essential part of a rigorous and broad-minded education, a flourishing society, and a happy life.

ACADEMIC EMPHASES

The Porter campus is the administrative home of the Arts Division and the History of Art and Visual Culture Department, but Porter College faculty fellows hail from every academic division on campus and from many non-academic professions. All of them share the philosophy of education that the college's curriculum embodies: first, discover how to learn; then, learn by doing; and finally, let your learning make a difference in the world.

The Porter College curriculum encourages students to explore unusual topics and provocative ideas, to test and revise hypotheses about the meaning of their experiences, to learn from the failures that are an inevitable part of new learning and discovery, and to assume responsibility for the decisions they make in their studies.

Additional information about Porter College academics, including Core Course requirements and other academic programs, is available here. (p. **Error! Bookmark not defined.**)

COLLEGE COMMUNITY AND FACILITIES

The traditional residence halls and apartments play an important role in bringing the college community together. Students are encouraged to spend their beginning years in residence in the college, where housing is available for 1,300 students. The residence halls are divided into smaller units or "halls," with from 30 to 35 students sharing a wing and restroom facilities. Theme or hall options include Single Gender, LGBTQIA+, Gaming, and Substance-Free (just to name a few). The six-person apartments are reserved for upper-division students.

Porter College is also home to the Transfer Community. The majority of on-campus incoming transfer students reside at Porter regardless of their college affiliation. Special programs are designed to help new transfer students adapt to life at UCSC.

In addition to traditional classrooms, Porter has many specialized facilities, such as student art galleries, a study center, and a dining hall that converts to a theater and programming space. Porter College also features a MakerSpace Co-op, dedicated to promoting Porter's creativity, building community, and providing a constructive positive outlet. Additionally, the MakerSpace has tools and materials available to use for personal crafting projects or even class assignments. The Arts Instructional Computing Laboratories, located at Porter College, consist of two high-end labs oriented toward the arts.

Porter provides many opportunities for relaxation and recreation to balance the intellectual demands of a university education. The Residential Life and Activities Office staff organizes

formal and informal events, including open-mic nights, dances, art activities, and the mural painting program.

Many students and faculty perform or exhibit their work at Porter. The Sesnon Gallery, the Porter/Kresge Dining Hall, the Porter Quad, and the faculty gallery host a wide range of artistic, cultural, and academic events each year.

For more information, call (831) 459-2273 or visit the Porter College website.

PORTER COLLEGE FELLOWS AND STAFF

Porter College faculty fellows are listed on the college's faculty directory.

Porter College staff are listed on the college's staff page.

Kresge College

ACADEMIC EMPHASES

Kresge's academic life is centered on the integration of living and learning in a community that values self-determination, consensus-building, intellectual freedom, sustainability, and justice. These principles take shape in a curriculum that emphasizes participatory learning, hands-on experience, and conscientious academic inquiry that transcends the walls of traditional classrooms. Ranging from media studies to food justice, writers' workshops to natural history, and journalism to service learning, Kresge's courses offer varied ways for Kresge students to fulfill GE requirements while broadening their educational experience in the company of dedicated and imaginative faculty.

Additional information about Kresge College academics, including Core Course requirements and other academic programs, is available here. (p. **Error! Bookmark not defined.**)

RESIDENTIAL LIFE

The architecturally renowned Kresge campus offers apartments rather than residence halls. The Kresge apartments attract students with a sense of independence and community participation. Distinctively designed, the apartments at Kresge Proper are configured for six to nine people. Kitchen and living areas look out onto the street, with other rooms facing the surrounding redwood forest. J and K Buildings' three-person apartments are reserved for continuing upper-division students. These two-bedroom apartments have a kitchen and combination dining and living area.

Kresge is home to the Writers House, a living/learning community for students interested in creative writing and journalism (regardless of major), and the Ecovillage, a community for students who want to actively create a new world based on cooperation and sustainable living.

The Residential Life and College Programs staffs at Kresge work to bring students of similar interests together academically and socially by designing fun and unique programs based on student interest. Programs that focus on celebrating the diversity of the residential community, and on enhancing academic success through music events, art and food-centered events are common.

COMMUNITY LIFE

A wide variety of events and activities shape community life at Kresge. Lectures, workshops, dances, and concerts are a regular part of student life at the college. The nature and tenor of these events are a reflection of the diverse interests of students and staff, who are committed to fostering voice, space, and opportunity for all community members.

Students actively shape the college community through participation in Kresge Parliament, an openly structured student organization responsible for voting the allocation of all college membership fees in support of activities and events. Parliament and Town Meetings also serve as a forum for the discussion of college and campus-wide issues with college staff and faculty. Additionally, students can get involved in the Media and Society Committee, the Kresge Multicultural Education Committee (KMEC), Food Co-op, or the Kresge Garden.

TRANSFER STUDENTS

In recognition of the wealth of diversity that transfer students bring to the community—in terms of culture and experience—Kresge is the home of the STARS program (Services for Transfer and Re-entry Students). This is a staffed facility where students can gather to relax, socialize, hold meetings, and obtain campus information and resource support in a central location regardless of college affiliation. The resource center offers workshops, social evenings, and special events tailored to meet the needs of transfer students.

STARS also offers special advising workshops and two- and three-credit courses designed to help transfers in the process of entering the university and moving forward in their careers.

FACILITIES

At the entrance to the college is the restful Piazzetta, with a beautiful, architecturally designed fountain, and the Kresge Garden, the largest student-run garden on campus. Leading off from the Piazzetta are STARS, the Seminar Room with a kitchen, the Commuter Lounge, and a student lounge equipped with television and DVD player. In addition to STARS, as a unique facility on the campus, the Commuter Lounge is a place for off-campus students who want to use a kitchen, shower, or lockers while on campus. Kresge's Photo Lab Co-op is above the Piazzetta and offers 24-hour accessibility to darkroom equipment. The college includes a study center with soaring ceilings and walls of glass overlooking the forest, which also

houses a writing center, a computer lab equipped with PCs for student use, and a student-run Food Co-op, where organic produce is sold and working memberships are available.

Kresge College is undergoing a four year redevelopment project. As a part of the first construction phase of the project the Town Hall, Music Co-op and the Owl's Nest Cafe will be off-line. More details and updates about the Kresge Project can be found on the Kresge web page.

For more information, call (831) 459-2071 or visit the Kresge College website.

KRESGE COLLEGE FELLOWS AND FACULTY

Kresge College faculty fellows are listed on the college's faculty directory.

Kresge College staff are listed on the college's staff page.

Oakes College

Oakes was founded in 1972 to provide high-quality education to students from diverse cultural and social backgrounds. Students, staff, and faculty associated with the college believe that learning takes place not only in the classroom, but also in residential settings. For that reason, they work hard to create a multicultural community whose members strive to achieve ambitious goals—including equal access to educational opportunity and freedom from oppression—while simultaneously affirming and celebrating their distinctive cultural backgrounds.

ACADEMIC EMPHASES

As a result of their experience at Oakes College, students will cultivate equity and justice. This is what drives Oakes College. The broad learning outcomes are for Oakes students to understand the self, community, systemic oppression, and action for change.

The Oakes College faculty represents a wealth of expertise from the natural sciences to the humanities, and we are proud to have some of the top scholars in the world among our faculty fellows. Our students major in nearly every discipline at UCSC—from economics and computer science, to theater arts and Latin American and Latino studies—and they are well supported by the depth and breadth of the Oakes College faculty and the extensive knowledge of our advising team. Oakes graduates have gone on to successful careers in fields such as medicine, law, education, medical research, and community service.

Additional information about Oakes College academics, including Core Course requirements and other academic programs, is available here. (p. **Error! Bookmark not defined.**)

COLLEGE COMMUNITY AND FACILITIES

Oakes College, located on the west side of the UCSC campus, commands a sweeping view of Monterey Bay. Students may choose between apartment and residence hall living. The residence halls have attractive courtyards, and views of the ocean and the city of Santa Cruz. Students can also share an apartment-style living space, which includes a common living area and small kitchen. Full-time coordinators for residential education and neighborhood assistants help residents develop cooperative ways of living together. As one student put it, “Oakes is a community where people of many different backgrounds, interests, and goals form a friendly neighborhood. We share our cultures and adapt to the different lifestyles of our neighbors.” The residential program is designed to assist all students in integrating their academic and social lives. The residential staff host activities sponsored through its wellness, academic success, leadership, and social justice and diversity committees.

The college staff seek to nurture and sustain a community in which mutual respect, understanding, and concern for others are the norm. Within that atmosphere of community expectations, students are also supported and encouraged to find room for their own creative personal expression.

The other facilities at Oakes further support the special programs of the college and provide recreational opportunities for the students. College facilities include the Learning Center, a multipurpose room for lectures, movies, and small theater productions; a college study center that is a quiet space for individual study, and a dining facility shared with Rachel Carson College. Adjacent to the Oakes Café is the Guzman Room, a social and group study space. Students and staff have worked together to create the Oakes Garden, which gives Oakes affiliates an opportunity to connect with each other and the earth to support sustainability and food security. Oakes is also home to the Underdome, a small outdoor basketball court great for friendly three-on-three competition. Additional recreational facilities located close to the college include tennis courts, a large recreational field, and an indoor basketball court. Oakes is named after Roscoe and Margaret Oakes in recognition of their generous philanthropy through the San Francisco Foundation.

For further information, call (831) 459-2558 or visit the Oakes College website.

OAKES COLLEGE FELLOWS AND STAFF

Oakes College faculty fellows are listed on the college's faculty directory.

Oakes College staff are listed on the college's staff page.

Rachel Carson College

Rachel Carson College is dedicated to environment and society, and the college has organized a vigorous intellectual life around this theme. The college examines environmental issues from

multiple perspectives, through the social and natural sciences, engineering, public policy, and science and technology studies. Rachel Carson College offers students a sense of community and opportunities to augment academic work with a wide range of extracurricular activities. These include events such as Earth Week, sustainability internships, and a minor in sustainability studies.

Rachel Carson College students major in nearly every discipline offered at UCSC, while sharing a strong commitment to environmental stewardship. We teach our students and graduates to become environmentally aware green citizens, with the capacity to evaluate sustainability policies and strategies and with the skills needed for hands-on engagement in the many projects and activities that will be required to ensure the future of the planet and human civilization.

ACADEMIC EMPHASES

Rachel Carson College's academic classes focus on the theme of environment and society. The college sponsors a number of educational initiatives and courses aimed at furthering its theme and mission, as well as programs offering experiential learning for students.

Additional information about Rachel Carson College academics, including Core Course requirements and other academic programs, is available here. (p. **Error! Bookmark not defined.**)

COLLEGE COMMUNITY AND FACILITIES

Rachel Carson College is located on a sunny, terraced hillside on the west side of the UCSC campus, offering a spectacular view of Monterey Bay and the coastline as well as the redwood-covered hills. The college is designed to encourage interaction among resident and commuter students, with outdoor spaces for relaxing and informal opportunities to socialize. These include small residence hall patios, grass quadrangles, and a large plaza—the heart of the college—where pedestrian traffic converges. Adjacent to the college are recreational facilities that include the West Field House, tennis courts, basketball and sand volleyball courts, and playing fields. The Theater Arts and Music Centers, McHenry Library, and Porter and Oakes Colleges are a short walk from the college. Other parts of the university are easily accessible by foot, bicycle or frequent shuttle buses.

Rachel Carson College's facilities include an academic building that accommodates the college and faculty offices, the Sociology Department, associated research centers, classrooms, and a computer lab with printers. Approximately 500 students live in the college's community of two- and three-story residence halls, which provide single, double, and triple rooms as well as suites. The residence halls include laundry facilities and lobbies that serve as living rooms—favorite places where residents gather to relax, watch television, and catch up on the news of the day. A number of these are themed residences that focus on special programming related to the respective theme.

Another 300 students are housed in Rachel Carson College's two-, three-, and four-bedroom apartments.

The college's residential staff includes both coordinators for residential education, who are full-time live-in professionals, and undergraduate resident assistants. The residential staff plans a variety of educational and recreational events, including community barbecues, outdoor movies, and student-initiated events that celebrate the diversity of our community. More intimate gatherings include study breaks, coffee talks, and potlucks. The residential staff is available to ease the transition to college life, making the college a comfortable new home for our residents.

The Student Commons building contains the Student Life Office, the office of Rachel Carson College's college programs coordinator, the office of the Student Environmental Center, and a large

meeting room for student use. A study center is located across the plaza. The Rachel Carson College Café is a favorite haven and gathering place for students, faculty, staff, and other members of the campus community.

In conjunction with the student government and student organizations, the Rachel Carson College Student Programs Office plans social, multicultural, and educational events for the college community. Weekly programs including open mics, music, art shows, and guest speakers accommodate the diverse spectra of cultural and artistic interests of the students. College Night, a quarterly cultural event, provides an opportunity for students to learn about a variety of cultures through entertainment, education, and delicious cuisine. In addition, the Student Programs Office works closely with the Student Environmental Center to bring programs that educate and build long-lasting networks, which aim to address the environmental issues affecting our world today.

Above all, Rachel Carson College seeks to create a community of inclusion, in which each person is encouraged to share and explore beliefs, worldviews, values, and ideas in an atmosphere of mutual support and trust.

For more information, contact the college at (831) 459-2361, email carsonhousing@ucsc.edu, or visit the the Rachel Carson College website.

RACHEL CARSON COLLEGE FELLOWS AND STAFF

Rachel Carson College faculty fellows are listed on the college's faculty directory.

Rachel Carson College staff are listed on the college's staff page.

College Nine

ACADEMIC EMPHASES

College Nine's theme of International and Global Perspectives emphasizes the causes and consequences of our increasingly interconnected world where responses to threats like climate

change and COVID-19 require large-scale collective action. Our academic and co-curricular programs analyze economic and cultural globalization, immigration, ethnic conflict, genocide, and human rights, among other issues. Students interested in these issues either as their major focus or as part of their general education are invited to join the College Nine community.

Additional information about College Nine academics, including Core Course requirements and other academic programs, is available here. (p. **Error! Bookmark not defined.**)

COLLEGE COMMUNITY

Founded in 2000, College Nine is one of the newest colleges at UCSC. College Nine creates an integrated living and learning environment through engaging academic and extracurricular programs focusing on the theme of International and Global Perspectives. Student leaders, faculty, and staff collaborate to develop an array of programs exploring the many aspects of the college's theme. Some of the programs include faculty presentations, guest speakers, conferences, debates, films, courses, arts events, and interactive workshops. These programs unite community members in an atmosphere of mutual respect, in which important contemporary and controversial issues are discussed.

College Nights

College Nights are community programs that feature a special dinner menu, entertainment, educational displays, and activities that relate to the college theme of International and Global Perspectives. College Nights provide an opportunity to gather as a community several times a year to enjoy a meal and share conversations. Planned by students and staff, past College Nights have focused on Earth Day and sustainability; music and dance from around the world; and popular culture. College Nights are held in the Dining Commons and are open to all College Nine students.

Student Government

The College Nine Student Senate serves as the student government for College Nine and represents its students to the college and campus administrations and to the Student Union Assembly (SUA), the campuswide student governance board. The Senate appoints representatives to campus and college committees, provides monetary support to student organizations, hosts community programs, and consults with college administration on policies development.

International Living Center

The International Living Center (ILC) at College Nine offers a unique living environment fostering understanding, cooperation, and friendship among upper-division students from different nations, cultures, and backgrounds. With a portion of the residents joining the community as domestic students from the United States, and the other portion of students joining from various countries around the world the ILC truly embodies the College Nine theme of international global perspectives. ILC

students reside in the Colleges Nine and Ten Apartments as they live together and learn from one another in this culturally immersive experience. Based out of the International Living Center, the International Affairs Group (IAG) offers all Colleges Nine and Ten community members the opportunity to engage in lively discussions about important current international issues with one another through guest speakers, film, literature, media, and personal experience.

iFloor

The iFloor is a combination of international first-year students and U.S. first-year students who apply to live in this intentional intercultural community housed within the College Nine residence halls. This unique community offers residents opportunities to make meaningful, lifelong friendships and connections that extend beyond borders.

Co-curricular Programs and Opportunities

Getting involved in co-curricular activities is a predictor of college success. Not only do college activities help students make friends, they foster leadership and group cooperation and build the key skills employers have identified that they want the work force to have in the 21st century. There are many opportunities at College Nine for student involvement. These include the following groups as well as many other programs, activities, and clubs.

(H)ACER

The (H)ACER Program at Colleges Nine and Ten integrates experiential learning with community engaged research projects to train undergraduate students in the ethics of community-engagement and politics of knowledge production. Students can participate in anywhere from one-day critical service learning experiences to yearlong research apprenticeships. In collaboration with our community partners, students engage in projects that address pressing issues such as social, economic, educational, and environmental injustice through an approach that pushes against deficit and damage-centered frameworks and honors the knowledge of community members.

Practical Activism: Tools for Local and Global Change

The annual Practical Activism Conference is a daylong, student-led conference featuring keynote speakers, multiple workshops, various on- and off-campus organizations, performances, and a variety of hands-on activism activities. Students gain valuable leadership and organizing skills through developing and planning this exceptional program, which involves collaboration among faculty, staff, and the local community. Visit practicalactivism.ucsc.edu for more information.

Community Garden

The Community Garden Club meets weekly to discuss sustainability issues, integrate the themes of our colleges into the garden design and practice, and work together on soil preparation, planting, and harvesting. Members of the Garden

Club learn about opportunities to work with our sister garden at Calabasas Elementary School in Watsonville.

Intercultural Community Weekend

This two-day retreat provides international and U.S. students from diverse backgrounds the opportunity to explore various components of intercultural communication. Through a series of structured exercises and small-group discussions, students share perspectives on intercultural issues, values orientation, and cross-cultural communication. The goal of the workshop is to build community and friendship between international and U.S. students as well as to increase students' understanding of the complexity of communicating across cultures.

PHYSICAL SURROUNDINGS

College Nine is situated in a redwood grove next to the Social Sciences 1 and 2 Buildings near the heart of campus. One of the campus's Instructional Computing Labs is conveniently located in the Social Sciences 1 Building. A nature preserve serves as College Nine's "backyard." College Nine students have immediate access to hiking, running, and mountain bike trails in the adjacent forest.

Residence halls offer approximately 600 single and triple bedrooms. These fully furnished residence halls include adjacent student study spaces, recreational areas, and WiFi. In addition, there is a state-of-the-art dining hall with an adjoining multipurpose room and recreation lounge for both College Nine and College Ten.

College Nine and College Ten also house approximately 400 upper-division students in apartments, with single, double, and triple bedrooms. All apartments have full kitchens, living rooms, bathrooms, and WiFi. Ground-floor apartments have decks, and most upper apartments have private balconies.

For more information about academic or general college programs, call (831) 459-5034, email 910capc@ucsc.edu, or visit the College Nine website.

COLLEGE NINE FELLOWS AND STAFF

College Nine faculty fellows are listed on the college's faculty directory.

College Nine staff are listed on the college's staff page.

College Ten

ACADEMIC EMPHASES

College Ten's theme of Social Justice and Community addresses a range of social, political, and economic inequalities--from racism and xenophobia to incarceration and educational inequity--and their impacts on society. In particular, our academic and co-curricular programs consider the injustices that many people confront in their lives, and situate them in historical, political, and structural contexts, informing possible pathways for resistance and change. College Ten provides

students with opportunities to make their own positive contributions to social change through community involvement and/or scholarly research.

Additional information about College Ten academics, including Core Course requirements and other academic programs, is available here. (p. **Error! Bookmark not defined.**)

COLLEGE COMMUNITY

Founded in 2002, College Ten is the newest college at UCSC. College Ten creates an integrated living-and-learning environment through engaging academic and extracurricular programs focusing on the theme of Social Justice and Community. Student leaders, faculty, and staff collaborate to develop an array of programs exploring the many aspects of social justice. Some of the programs include faculty presentations, guest speakers, debates, films, arts events, courses, and interactive workshops. These programs unite community members in an atmosphere of mutual respect, in which contemporary and controversial issues are discussed.

College Nights

College Nights are community programs that feature a special dinner menu, entertainment, educational displays, and activities that relate to the college theme of Social Justice and Community. College Nights provide an opportunity to gather as a community several times a year to enjoy a meal and share conversations. Planned by students and staff, past College Nights have focused on Earth Day and sustainability; music and dance from around the world; and popular culture. College Nights are held in the Dining Commons and open to all College Ten students.

Student Government

The College Ten Student Senate serves as the student government for College Ten and represents its students to the college and campus administrations and to the Student Union Assembly (SUA), the campuswide governance board. The Senate appoints representatives to campus and college committees, provides monetary support to student organizations, hosts community programs, and consults with college administration on policies development.

Rumi's Field

Named after a renowned peace-seeking Sufi poet, Rumi's Field offers an opportunity for students who wish to learn, live, and interact using the skills of Nonviolent Communication (NVC) and exploring social justice through the lens of nonviolence. Nonviolent Communication strengthens one's ability to inspire empathy from others and respond compassionately even under difficult circumstances. This community of College Ten first-year and continuing students offers the opportunity to engage in dialog and resolve conflict using NVC consciousness as a tool for personal and societal transformation.

Co-curricular Programs and Opportunities

Getting involved in co-curricular activities is a predictor of college success. Not only do college activities help students make friends, they foster leadership and group cooperation and build the key skills employers have identified that they want the work force to have in the 21st century. There are many opportunities at College Ten for student involvement. These include the following groups as well as many other programs, activities, and clubs.

Practical Activism: Tools for Local and Global Change

The annual Practical Activism Conference is a daylong, student-led conference featuring keynote speakers, multiple workshops, various on- and off-campus organizations, performances, and a variety of hands-on activism activities. Students gain valuable leadership and organizing skills through developing and planning this exceptional program, which involves collaboration among faculty, staff and the local community. Visit practicalactivism.ucsc.edu for more information.

(H)ACER

The (H)ACER Program at Colleges Nine and Ten integrates experiential learning with community-engaged research projects to train undergraduate students in the ethics of community engagement and politics of knowledge production. Students can participate in anywhere from one-day critical service learning experiences to yearlong research apprenticeships. In collaboration with our community partners, students engage in projects that address pressing issues such as social, economic, educational, and environmental injustice through an approach that pushes against deficit and damage-centered frameworks and honors the knowledge of community members.

Multicultural Community Weekend

This two-day retreat provides students from diverse backgrounds the opportunity to explore aspects of social justice, diversity, and community through a series of exercises and discussions. Participants explore issues impacting our individual identities (e.g., race, class, gender, sexual orientation, ability, religion); increase their understanding of the complexities of communicating across diverse experiences and backgrounds; build communication skills; and share in celebrating and deconstructing the diversity of our community. Students apply for this opportunity in the fall.

Terry Freitas Café

Located at College Ten, the Terry Freitas Café is a student-run lounge with a long legacy as a favorite gathering place among students. It is open daily for performances, music, and social interaction. Café student baristas serve coffee and various snacks for a small donation. The café is named after former UCSC student Terry Freitas, who dedicated his life to making the world a more socially just place.

Community Garden

The Community Garden Club meets weekly to discuss sustainability issues, integrate the themes of our colleges into the garden design and practice, and work together on soil preparation, planting, and harvesting. Members of the Garden Club learn about opportunities to work with our sister garden at Calabasas Elementary School in Watsonville.

PHYSICAL SURROUNDINGS

College Ten is situated in a redwood grove next to the Social Sciences 1 and 2 Buildings near the heart of campus. One of the campus's Instructional Computing Labs is conveniently located in Social Sciences 1. A nature preserve serves as College Ten's "backyard." College Ten students have immediate access to hiking, running, and mountain bike trails in the adjacent forest.

Residence halls offer approximately 600 single and triple bedrooms. These fully furnished residence halls include student study spaces, recreational areas, and WiFi. In addition, there is a state-of-the-art dining hall with an adjoining recreational lounge and Terry Freitas Café, a coffee lounge for both Colleges Nine and Ten. Colleges Ten and Nine also house approximately 400 upper-division students in apartments, with single, double, and triple bedrooms. All apartments have full kitchens, living rooms, bathrooms, and WiFi. Ground-floor apartments have decks, and most upper apartments have private balconies.

For more information about academic or general college programs, call (831) 459-5034, email 910capc@ucsc.edu, or visit the College Ten website.

COLLEGE TEN FELLOWS AND STAFF

College Ten faculty fellows are listed on the college's faculty directory.

College Ten staff are listed on the college's staff page.

Student Life

Campus life is all about learning, discussion, and debate; meeting people from diverse backgrounds; making new and lasting friendships; attending cultural celebrations and artistic and musical performances; and getting involved with student organizations and clubs. UCSC provides a wealth of opportunity for personal growth within the context of a rich and meaningful academic experience. Students live, study, and socialize with others from their college as well as with students from the other colleges. UCSC's colleges (see *The Colleges* (p. 1221)) and various campus units provide a wide range of student services to respond to individual needs, interests, and levels of personal development. In addition, students can take advantage of the campus's stunning natural setting, the friendly and engaging local community, and easy access to the Monterey and San Francisco Bay areas.

Santa Cruz Community

Located on the northern tip of Monterey Bay, Santa Cruz is famous for its Mediterranean climate, forested state parks, and miles of scenic beaches. Recreational opportunities abound—hiking through redwood forests, bicycling along mountain roads, and surfing, sailing, and scuba diving. The Santa Cruz Mountains are minutes away; the majestic Sierra Nevada is a four-hour drive to the east.

The metropolitan centers of the San Francisco Bay Area are easily accessible. By car, Berkeley and San Francisco are less than two hours from campus. San José, Monterey, and Carmel are one hour away.

The city of Santa Cruz, with a population of about 65,000, was originally founded as a Spanish mission. Santa Cruz is a small community with cosmopolitan appeal and a strong awareness of environmental and political issues.

Housing

At UC Santa Cruz, students are housed in small-scale residential communities, which provide close-knit living environments within the larger university. Each community provides an academically and socially supportive environment and offers special programs designed to help students transition to campus life, build a strong connection with the campus, and get the most out of their UCSC experience. A space in university housing is guaranteed to all new undergraduate students entering in the fall quarter who submit all forms and required fees by stated deadlines.

After accepting the UC Santa Cruz offer of admission, all undergraduate students become affiliated with one of our 10 colleges. Once affiliated with a college, all students are sent information about the housing options available, and instructions for completing the online housing application/contract process. The housing options available to you will differ depending on whether you are a freshman or a transfer student—though all students have access to campus dining facilities. Housing application periods open in mid-May for new freshmen and mid-June for new transfers entering in the fall.

College Residences

The colleges differ in academic focus, environment, location, architecture, and programs offered. However, all 10 colleges are dynamic, engaging learning communities that offer opportunities for students to help build and shape their experiences.

Freshmen are generally assigned to live in residence halls at their college, except at Kresge College, which has all apartments. Residence hall floors are typically shared by 15 to 50 students and have common bathrooms. Students can request to live in a mixed-gender (students of any gender live on the same floor or apartment, though bedrooms are single-gender) or single-gender (students of a single gender live on the same floor or apartment) area. Room assignments allowing transgender and gender-nonconforming students and their allies to live together in the same room regardless of gender or legal gender

are also available by request. Apartments, typically shared by four to seven students, have common living/dining rooms, kitchens, and bathrooms, and a combination of shared and private bedrooms. Each community provides accessible housing for students with disabilities. Incoming transfer students reside at the Transfer Community, or the University Town Center, regardless of college affiliation.

A variety of theme-housing options are available for those who are interested. Based on academic pursuits, hobbies, individual backgrounds, and lifestyle preferences, these options serve to complement a student's experience in residence.

Each college's residential program is a team effort. Live-in student and professional staff members provide orientation and support services, organize activities and events, provide referral information about academic or personal concerns, and assist with roommate problems.

All students living in campus residence halls (including the transfer community) have a meal plan included in their housing contract. Meal plans are optional for apartment residents. Students with meal plans may use their student ID cards to access any of the dining halls on campus. Meal plans include Flexi Dollars (a dollar-for-dollar exchange for "food dollars" that can be used at college coffee shops, campus restaurants, and all dining halls). Additional Flexi Dollars may be added to any meal plan. More information on the colleges, including videos, can be found here and at the Housing website.

Redwood Grove

Located on the west side of campus, the Redwood Grove apartments are an extension of the transfer community at Porter College, and provide an apartment living environment for a limited number of incoming transfer students. Each apartment has private and shared bedrooms, a living room, kitchen, dining room, and bathroom. Information is available at Redwood Grove and by email at redwoodgrove@ucsc.edu.

The Village

Located in the Lower Quarry, The Village is a unique community for continuing students. Each of the 17 houses features nine single bedrooms, three bathrooms, and a kitchenette. A meal plan is optional. A manager's apartment, office, laundry facility, community kitchen, and community lounge are located on site. Information is available at The Village and by email at village@ucsc.edu.

University Town Center

The University Town Center, located at the corner of Pacific and Cathcart in downtown Santa Cruz, houses continuing and transfer students in two- and three-person studio apartments. A meal plan is optional. Information is available at UTC and by email at utc@ucsc.edu.

Family Student Housing

Family Student Housing has apartments for students and their families. Students must reside with at least one eligible family member on a permanent, full-time basis. Eligible family

members include children, a spouse or adult partner, a parent, or a sibling. The apartments are unfurnished, and each has two bedrooms, a bathroom, a small study, a combined living/dining area, and a kitchen. Several apartments are accessible to people with mobility impairments. Also, see information on child care and youth programs, below. Information is available at Family Student Housing, and by email at fsh@ucsc.edu.

Camper Park

A 42-space Camper Park is located on the north side of campus and includes university-owned single-occupant recreational vehicles that are rented to students. The park includes a community building with rest rooms, showers and laundry facilities, and a lounge/study room. Information is available at Camper Park and by email at camperpark@ucsc.edu.

Graduate Student Housing

Conveniently located adjacent to "Science Hill," home to many of UCSC's main academic facilities, each apartment offers four single bedrooms, a living room, kitchen, dining room, and bathroom. Ground floor apartments have decks, while upper apartments have private balconies. Information is available at grad housing and by email at gradhsg@ucsc.edu.

Campus Housing Office

The Housing Office is responsible for the application and contract records for all single students living in campus residence halls and apartments, The Village, University Town Center, and Graduate Student Housing. Advisers are available on a drop-in basis to assist students with any questions regarding housing contract policies and procedures, housing and dining charges, payment plan options, meal plans, and more.

Location: 104 Hahn Student Services Building (8 a.m. to 5 p.m., Monday through Friday). Information is available at housing and by email at housing@ucsc.edu.

Community Rentals Office

Students interested in finding their own accommodations in the off-campus community are encouraged to use the resources available through the UCSC Community Rentals Office. Community Rentals maintains online rental listings to assist students in locating rental housing and serves as an information and advising resource.

Location: 104 Hahn Student Services (8 a.m. to 5 p.m., Monday through Friday). Information is available at community rentals and by email at communityrentals@ucsc.edu.

Athletics and Recreation

Athletics and Recreation provide a variety of interesting programs, activities, and developmental opportunities in which all students from any background or skill level are invited to participate. The department strives to develop skills and habits related to fitness and wellness that last a lifetime for students to enjoy athletic and recreational activity.

You can obtain further information about the programs described below from Athletics and Recreation located at the East Field House, (831) 459-2531. Visit the Athletics & Recreation websites at goslugs.com or recreation.ucsc.edu.

Physical Education Courses

Physical Education offers students an opportunity to learn and improve skills in a variety of areas while gaining knowledge about the relationship between fitness and wellness. With these experiences, students are more equipped to make important choices leading to healthy lifestyles.

Regularly scheduled courses, which carry no academic credit but are recorded on your transcript, are available in a broad range of physical activities (see Physical Education (p. 1101)). Many classes are small, and all offer expert instruction and welcoming environments. Students may enroll in as many courses as they desire and are permitted to repeat any course. While many of the courses are for students at the beginning level, some are designed for the more advanced student.

Subjects offered include swimming, scuba, sailing, rowing, kayaking, basketball, racquetball, tennis, volleyball, ballet, folk dance, jazz dance, modern dance, fencing, soccer, tai chi chuan, strength training, fitness and conditioning, yoga, aikido, and more. See the Physical Education website for more information.

Intramural Sports

Intramural Sports offers a wide variety of traditional and niche recreational sports opportunities designed to encourage participation for all enrolled students to play together on campus. The program prides itself on sportsmanship, inclusion, community, and fun.

Intramural Sports are structured for all skill levels and are conducted in a safe, supervised environment. You do not need to be an experienced athlete to play! Intramural Sports are open to all UC Santa Cruz students and staff/faculty with current memberships. Intramural Sports are a fun way to play, meet friends, learn new sports, and relieve the stress of daily routines. Most activities allow you to select the days and times you play, as well as the people on your team. Check out the Intramural Sports website to learn how and when to register.

Sport Clubs

UC Santa Cruz Sport Clubs are student-driven and student-managed organizations that strive for skill building in leadership, problem-solving, collaboration, and financial management. These organizations participate in a variety of active-lifestyle activities that compete with other university club organizations. Sport Clubs also hosts recreational clubs for those less inclined for competition. Please visit the Sport Clubs website to see learn more about Sport Clubs at UC Santa Cruz.

Intercollegiate Athletics

UC Santa Cruz offers the only National Collegiate Athletic Association (NCAA) Division III program in the University of California system. As a Division III member, the program offers no scholarships or grants in aid that are based on athletic

ability. UC Santa Cruz sponsors the following intercollegiate sports: men's and women's basketball, soccer, swimming and diving, tennis, volleyball, cross country, track, and women's golf. For schedules, rosters, and more information on Athletics at UC Santa Cruz please visit goslugs.com.

Adventure Rec

The Adventure Rec program within the Athletics & Recreation department is designed to provide the UC Santa Cruz community with an opportunity to develop skills, have fun, be challenged, and make healthy social connections through outdoor, recreational, and hands-on learning experiences. Adventure Rec offers a wide range of programs that provide opportunities for beginners as well as more experienced participants. Students can expect well-organized activities as well as informal experiential learning. are led by Adventure Rec UC Santa Cruz student leaders. Much like the rest of the Athletics & Recreation department, student leaders make up the foundation of the Adventure Rec , bringing experience and enthusiasm to all that participate.

Athletics & Recreation also offers outdoor equipment rental. Anything from surfboards to wetsuits, tents to sleeping bags, and UC Santa Cruz has all the high-quality backpacking and camping gear a student could need. Students interested in planning their own outings should contact the Adventure Rec staff for assistance or sign up for one of the available adventure preparation program offerings. Adventure Rec also provides bicycle licensing and offers a free, weekly drop-in bicycle maintenance program. Please visit the Adventure Recreation website for activities and information.

Sammy Slug

The Banana Slug, a bright yellow, indigenous gastropod found in the redwood forest on campus and around Santa Cruz County, has not always been the official mascot for UC Santa Cruz. In fact, the University didn't initially have formal, organized, and campus-supported athletics for enrolled students when founded in 1965. By 1980, students had made it clear there was a sincere desire for more organized and University-supported participation in intercollegiate competition. That is when UC Santa Cruz became an institutional member within DIII of the NCAA.

Institutional membership with the NCAA requires an official team name, yet for the first 15 years of its existence, the University did not have one. Chancellor Robert L. Sinsheimer gathered a focus of student-athletes and from that, made a decision to name the University's new mascot: the Sea Lions. The new name was soon challenged by a grassroots effort by students on campus, which led to publicity in local and national media as more UC Santa Cruz students campaigned to officially become the Banana Slugs. Even after a Sea Lion was painted on the West Field House hardwood, students continued to cheer and chant for the Banana Slugs. Bronze statues of sea lions in the heart of campus were vandalized with yellow paint and antenna glued to the top of the sea lion heads to transform them into Banana Slugs. After years of relentless effort and stalemate a student-led, campus referendum was organized in 1986 to decide the UC Santa Cruz mascot once and for all. The vote

was overwhelmingly in favor of the Banana Slugs and the rest is history.

Be on the look out this fall to participate in the #EvolveSammy campaign and help campus decide how Sammy Slug evolves into the next era!

Facilities

UC Santa Cruz Athletics & Recreation hosts a variety of facility spaces for students, faculty/staff, and community to participate in athletic and recreational activities. The East Field House (EFH) complex is one of the most popular areas of campus with over half of the student population visiting the complex at least once during the year. There you will find our 50m pool, six tennis courts, multiple dance studios, indoor and outdoor basketball courts, two sand courts, nine acres of recreational field space, an outdoor strength-training and cardiovascular-fitness installation, a ½ mile jogging path, one natural grass competition surface, and a 6,500 square foot fitness center complete with cardio and strength training equipment as well as incredible vistas of the Monterey Bay. The EFH complex is also home to our personal training and group fitness classes offered by the Athletics & Recreation FitLife program. More information is available on the FitLife website. More information is available on the FitLife website.

The West Field House is home to our basketball and volleyball teams and is a great place to enjoy the Banana Slugs compete against Coast to Coast Athletic Conference members or other NCAA DIII opponents. There are also 6 tennis courts, 2 sand courts, outdoor basketball, and a smaller recreational field space for students to enjoy within the Rachel Carson College area of campus.

UC Santa Cruz Athletics & Recreation also leases additional facility spaces for students in Santa Cruz, including Kaiser Permanente Arena downtown for select basketball and volleyball games (visit goslugs.com for game schedules) and the Santa Cruz Harbor. The UC Santa Cruz Community Boating Center is located on FF Dock at the Santa Cruz Small Craft Harbor. Our Boating Center is home to Physical Education courses, a community boating club, and our competitive Sailing Club which operates as a Sport Clubs student organization. Summer sailing courses are also available for those interested. Boating courses are offered for dinghies, 24–32' keel boats, sea kayaks, and rowing shells. Please visit the Boating Center website for more information.

Sustainable Living Center Programs

Program in Community and Agroecology (PICA), an academic program of the Environmental Studies Department, is an experiential living/learning program at UCSC. Students use agroecology principles in the maintenance of a half-acre organic garden, work together to develop community projects, and share in the many aspects of sustainable living—by harvesting, cooking, and eating healthy food grown organically right next to their rooms. Through a unique collaboration that integrates classroom instruction and community-based

experience, PICA has become a model experiential learning program that allows students to practice sustainability at a hands-on level. All UCSC students are invited to come and participate in PICA activities such as sustainability workshops and garden workdays. For further information, please visit the PICA website.

On-campus living at PICA. The PICA residential program offers students an alternative to traditional on-campus living. At the Village in the Lower Quarry, students from across academic disciplines come together to create a sustainable living environment on campus. PICA residents grow organic food at the nearby Foundational Roots Garden, come together to share in weekly community meals, and manage a Village-wide composting program. This living/learning experience allows students a way to link healthy communities with healthy food systems.

Friends of CAN (FoCAN) is a UCSC student organization affiliated with the Community Agroecology Network (CAN), a nonprofit organization that works with partner communities in rural Mexico and Central America to develop self-sufficiency and sustainable farming practices. CAN promotes integrated approaches to sustainable community development as a means to sustain rural livelihoods and environments through three programs: Action Education, Trade Innovations, and Action Research Initiatives. CAN's Field Study offers opportunities, intercultural exchanges, research, and the annual Agroecology Shortcourse, which inspire action for environmental sustainability and social justice.

Field Studies. The CAN Field Study program provides college students and recent graduates the opportunity to live and learn in rural Mexico and Central America. It offers students a realistic first step in doing international work that focuses on environmental sustainability and social justice. In developing close relationships with a rural community and working with them on a project, students come to understand the complexity and satisfaction of engaging meaningfully in international community development. CAN also offers local internship and volunteer opportunities to students interested in engaging with community projects connected to CAN's international partners in Mexico and Central America.

Together PICA and FoCAN facilitate hands-on learning activities that engage students with all aspects of a sustainable food system—from growing organic food that supports local communities to conscious consumerism on a global level.

Student-Run Cooperatives

Kresge Food Co-op

Bike Co-op

The Bike Co-op is student owned and operated, run cooperatively, and nonprofit. Whether you need to purchase a bike, repair a bike, or want to learn, the co-op can accommodate your needs. People are encouraged to attend meetings, learn more about cooperatives, and get involved. The Bike Co-op will reopen for fall 2021 quarter. It is located at the Redwood

Building, next to the Student Union.

Transportation and Parking Services (TAPS)

Transportation and Parking Services (TAPS) provides and manages access to the UC Santa Cruz campus, with a focus on sustainable transportation modes. By providing alternatives to bringing a car to campus, TAPS helps reduce the demand for on-campus parking, reduce greenhouse gas emissions, and mitigate the impacts of travel on the surrounding community. These efforts support the UC Carbon Neutrality Initiative and the Campus Sustainability Plan, and are one of the reasons that UC Santa Cruz regularly ranks as one of the “greenest” colleges in the nation.

To support these efforts, parking for undergraduate students is either prohibited or extremely limited. Freshman and sophomore students who live on campus are generally not eligible to purchase parking permits. All commuting students and juniors and seniors who live on campus may apply for a permit; however, due to the limited number of parking spaces on campus, there is no guarantee of actually being able to purchase one. Historically, permits have sold out before the start of fall quarter, and have only been available through an appeals process for the remainder of the academic year. (Those students, including residential freshman and sophomores, with a documentable need for a parking permit, such as job or family responsibilities, or health-related needs, may use the appeal process to request a permit.)

Off-campus parking options are also extremely limited, and typically sold out before classes begin in fall quarter. If you will be living on campus, and are not eligible to purchase an on-campus parking permit, you should not expect to be able to park your vehicle anywhere nearby.

Gift cards, raffles, and other prizes are some of the rewards possible for using a sustainable transportation choice. Sign up at Cruz511.org and download the Commute Tracker app to log your trips.

For additional information, visit the TAPS website.

Transportation Options

Campus Transit: On-campus shuttles and Disability Van Service are provided fare-free through the Student Transit Fee. TAPS shuttles operate on campus from approx. 7:30 a.m. to 11:30 p.m. Monday through Friday, and from 6:00 p.m. to 11:30 p.m. on weekends.

METRO Buses: Santa Cruz Metropolitan Transit District (METRO) is the transit bus service provider for Santa Cruz County. METRO operates more than 25 bus routes throughout the county, including five routes to and from the residential UC Santa Cruz campus, and one route between the residential UCSC campus and the Coastal Science Campus (CSC) during fall, winter, and spring quarters. UCSC students can ride METRO fare-free throughout the county by showing a student ID card with a current quarter validation sticker.

Bike Program: TAPS offers a variety of programs, including over 3,500 bike-rack spaces, bike “fix-it” stations, bike lockers,

helmet/light giveaways and morning bike shuttles that run from CVS Pharmacy on Mission Street to campus. Popular bike services include the Bike Library, which lends bikes for free on a quarterly basis, e-bike workshops, free bike maintenance clinics, and free bike skills classes. Visit slugbikelife.org for upcoming bike events and programs.

Car Sharing: Zipcar is a membership-based car share program that allows students 18 and over to rent cars on campus on an hourly or daily basis. Use fees start at \$5.50 per hour and include all vehicle fees, gas, insurance, mileage, and reserved parking on campus. Members have access 24 hours per day to a variety of vehicles both on campus and at nearby Santa Cruz locations. For detailed information, visit the campus Zipcar website.

Carpool Ridematching: Cruz511 offers a county-wide ridematching program that spans from San Francisco to Santa Cruz. Download the Commute Tracker mobile app to start finding carpool buddies. Even if you don’t have a car, you can post the ride you need. If you have a car, you can share your trip with others and save on costs. You can list your regular commute to campus or your one-time trip needs through Cruz511.

Walking: UC Santa Cruz is one of the most beautiful campuses in the world, and the best way to experience it is on foot! Walking is the single most sustainable means of getting around (and often the most direct way, as well) so be sure to bring a pair of sturdy walking shoes. A walking map of the campus is provided to all new students.

Long-Distance Train/Bus Service and Airports: Northbound Amtrak is available from the San Jose Diridon Station, which can be accessed by the Hwy 17 bus. Southbound Amtrak service is available from San Jose or Salinas.

The nearest airport is in San Jose, approximately 35 miles from Santa Cruz. The San Francisco Airport is about 70 miles from campus. Both airports are accessible by taking the Highway 17 Express bus that runs between Santa Cruz and San Jose, including a stop at the San Jose Diridon Station, where connections to Amtrak and other local and regional transit services are available. Commercial van and limousine services are also available.

Student Health Services

Located on McLaughlin Drive across from Colleges Nine and Ten, the Student Health Center provides quality health care focused on the particular needs of students. All registered students can access the Student Health Center and can always have a consultation with a nurse. Care is provided by board-certified physicians, nurse practitioners, and physician assistants. Students can be seen by appointment or, in cases of illness or injury, on the same day at the Same Day Clinic. In case of emergencies, either during the day or after normal operating hours, please call 911.

In addition, the Student Health Center offers counseling and psychiatry services, nutritional counseling, health promotion, X-ray, laboratory, optometry, and pharmacy services on site. The center is open weekdays during the regular academic year. For summer services and hours, or for additional information,

visit the Student Health Center website or email healthcenter@ucsc.edu.

Student Health Insurance

To ensure that emergencies and other health care costs do not interfere with a student's education, all University of California students are mandated by the UC Regents to carry health insurance. A comprehensive and affordable program specifically designed for students is available through the university via the University of California Student Health Insurance Plan (UC SHIP). All students are automatically enrolled in UC SHIP and billed quarterly through their student account, unless they choose to waive this coverage by providing proof of suitable insurance annually by the specified deadlines. For detailed information regarding insurance coverage and the waiver process, see Billing and Insurance Information page on the Student Health Center website. The Student Health Center only accepts UC SHIP, not any other health insurance plans.

For students who successfully waive UC SHIP, it is recommended that students and families consider adding CruzCare, which provides access to the Student Health Center for illnesses and injuries and covers in-house laboratory tests and X-rays, for a quarterly flat fee. Fees will be assessed for most visits for students without UC SHIP or CruzCare.

Immunization and Tuberculosis Screening Requirements

UC-wide, all incoming UC students, (frosh, graduate, transfer, and returning) are **required** to obtain specific vaccines and tuberculosis (TB) screening *before coming to campus*. Compliance with this requirement will be tracked by student's submission of an online Immunization form and TB Risk screening. These forms **must be** submitted securely online at student health. Failure to complete this process will result in an enrollment hold. For more information about UCSC Student Health Services and the UC-wide immunization requirements, please visit the Student Health Center website.

Student Health Outreach and Promotion (SHOP)

SHOP is UC Santa Cruz's destination for information, conversation, and self-exploration. It's the place for students to go to learn about health and wellness in a safe, non-judgmental environment.

SHOP provides opportunities for students to explore and enhance their health and wellness as they pursue their academic goals. SHOP offers information, education, resources, and support on issues related to alcohol and other drugs, sexually transmitted infections and sexual health and other concerns relevant to college students. All UCSC students are welcome and encouraged to drop in and speak with SHOP's professional and student staff. Students can get involved with SHOP by becoming peer educators, HIV test counselors, volunteers for the Condom Co-op, and/or CUIP interns.

Alcohol and Other Drug (AOD) Education

SHOP empowers students to reduce risks related to substance use/abuse. Students can meet with staff confidentially to discuss their personal AOD involvement, discuss concerns about friends or family members, obtain educational materials, participate in workshops, and access resources for students in recovery. Educators provide formal and informal sessions and workshops for students, college residential staff, and other campus groups. For information call (831) 459-1417 or visit the SHOP website. **NOTE:** In January 2014, UC Santa Cruz implemented a campuswide smoke and tobacco-free policy.

HIV and Other Sexually Transmitted Infection (STI) Prevention

SHOP offers many resources for promoting sexual health, including:

- Free, anonymous HIV testing with Orasure (no needles) provided by student peer test counselors. Results in 20 minutes.
- The Condom Co-op, selling safer sex supplies at reduced cost.
- The Birth Control Patrol—make an appointment with a peer to choose a contraceptive option.
- Workshops, activities, and events.
- Sexual health questions? Speak to a SHOP staff person.

SHOP is located at the Student Health Center. For more information, visit the SHOP website, call (831) 459-3772, or email shop@ucsc.edu.

Campus Advocacy, Resources and Education (CARE)

Campus Advocacy, Resources and Education (CARE) provides support, advocacy, resources, and violence prevention education to the UC Santa Cruz community. We respond to the needs of students, staff, and faculty impacted by sexual assault, dating/domestic violence, and stalking by providing confidential advocacy services. CARE services are survivor-centered and trauma-informed.

To request an appointment with a confidential CARE Advocate, email care@ucsc.edu or call 831-502-CARE (2273).

CARE also works collaboratively with students, faculty, and staff to educate the campus community about the vital role that each of us has in preventing violence and creating a culture of consent and respect. We supervise a peer prevention education program for students covering topics including:

- How to support survivors
- Reporting options
- Healthy communication and relationships
- Bystander intervention skills

- Media literacy

CARE is located at Kresge 714, near the Owl's Nest Cafe. Find us online at CARE, or follow us on Facebook by searching "UCSC CARE."

Counseling and Psychological Services (CAPS)

Counseling and Psychological Services (CAPS) offers a range of professional services to undergraduate and graduate students seeking help with personal concerns. We provide assistance for students with academic and personal stress, relationship and family issues, drug and alcohol problems, psychological problems, and crisis situations. Psychiatry services include diagnostic evaluations or prescribing of medication in certain situations. Depending on a student's needs, a student may be provided with brief individual or couples counseling, group counseling, psychiatric services, crisis intervention, or a referral for open-ended or long-term therapy off campus. CAPS also provides ADHD assessments, psychosocial groups, and online options. Information provided to any CAPS professional staff member is confidential within the student health center and cannot be released without a student's permission except in specific circumstances involving risk and safety. All services are aimed at helping students gain greater personal effectiveness and academic success. Professional staff members are available at various locations on campus, including the Student Health Services building, the colleges, and Family Student Housing. Emergency on-site crisis services and after hours crisis services are also available.

Staff members are available to provide consultation to staff, faculty, individuals, or family members for assistance in helping students in distress. Counseling psychologists can also provide trainings and programs on a variety of mental health topics, stress and coping skills, multicultural issues, and organizational development.

For more information visit the Counseling and Psychological Services website or call (831) 459-2628.

Resource Centers

African American Resource and Cultural Center (AARCC)

The African American Resource and Cultural Center (AARCC) develops and fosters co-curricular initiatives that promote academic success, leadership training, student development, and social engagement. Since the center's inception in 1991, the program's primary mission has been to serve as a key resource to acclimate students to general campus life and academic culture. In addition, the program provides advocacy and support in helping to monitor students' academic progress and subsequent achievement of their educational goals. AARCC works closely with overall campus outreach efforts to enhance the recruitment and retention of students who self-identify within the African diaspora.

AARCC works directly with numerous (student) organizations, which include, but are not limited to, National Society of Black

Engineers (NSBE), African/Black Student Alliance (A/BSA), African American Theater Arts Troupe (AATAT), African Student Union (ASU), Black Sistas United, (BSU) Black Men's Alliance (BMA), Destination Higher Education (DHE), Rainbow Theatre, Rosa Parks African American Theme House (R.PAATH), Delta Sigma Theta Sorority (DST), Black And Queer Questioning (BLAQQ), Black Campus Ministries (BCM), and UMOJA.

AARCC works collaboratively with various campus units/departments and in the surrounding community to enhance cultural and ethnic diversity initiatives on the UCSC campus. AARCC is located on the third floor of the Bay Tree Building in Quarry Plaza, and is open Monday through Friday from 10 a.m. to 5 p.m. For more information, call (831) 459-3207, email aarcc@ucsc.edu, or visit the AARCC website.

American Indian Resource Center (AIRC)

The American Indian Resource Center (AIRC) works in collaboration with other resource centers, faculty, staff, students, and organizations such as the Student Alliance of North American Indians (SANAD), the University of California American Indian Counselors/Recruiters Association, the Amah Mutsun Tribal Band of California Indians, as well as the indigenous tribal community leaders of the region to develop co-curricular programming, cultural activities, and events that assist public understanding of native peoples. Invested in creating a campus climate that supports all students, the center provides leadership development, internship opportunities, mentoring, and personal and academic advising. The AIRC is located on the third floor of the Bay Tree Building in Quarry Plaza. For more information, call (831) 459-2881, email [aairc@ucsc.edu](mailto:airc@ucsc.edu), or visit the AIRC website.

Asian American/Pacific Islander Resource Center (AA/PIRC)

The Asian American Pacific Islander Resource Center (AA/PIRC), established in 1999, provides and enhances opportunities for developing leadership, building a stronger sense of community on campus, and linking students to community service opportunities. AA/PIRC offers education and dialogue on issues affecting Asian American/Pacific Islanders with the goal of addressing students' multiple and diverse academic, social, cultural, and other co-curricular needs. Students can also gain leadership experience through the AA/PIRC Internship, volunteering, and/or participating in student programs.

AA/PIRC is located on the third floor of the Bay Tree Building at the Ethnic Resource Centers. Add your email address to AA/PIRC's listserv to receive campus and community announcements. For more information, call (831) 459-5349; email aapirc@ucsc.edu; or visit the AA/PIRC website.

Chicano Latino Resource Center (El Centro)

The Chicano Latino Resource Center (El Centro) is a hub of organized activities and resources that support Chicana/o/x and Latina/o/x student transition, retention, and academic advancement at the university. Through collaborative efforts

with campus partners, students can participate in a host of activities that encourage intellectual growth, leadership development, preparation for graduate or professional school, and career options. El Centro encourages and supports student and community development through cultural and educational programming. Annual programs include the following: Bienvenida—New Student Welcome Program; Día de los Muertos; Pachanga; Cesar Chavez Convocation; dialogue on academic, social, cultural, and personal issues that affect the Chicanx and Latinx communities; and a weekly online newsletter; CHISME E-News. El Centro offers student internships that support leadership-skills development, while students help to organize events and activities. For more information or to schedule an appointment, call (831) 459-5806 or email elcentro@ucsc.edu, or visit El Centro.

Cantú Queer Center

The Cantú Queer Center at UC Santa Cruz provides an open, inclusive, intersectional, and welcoming space, promoting education about all genders and sexualities, and empowering self-exploration of these identities. We serve as a resource to LGBTQIA students by providing opportunities for leadership and personal development and through programs and services that work to eliminate heterosexism, bi-phobia, and gender-identity oppression. We strive to develop an atmosphere of acceptance and well-being from which the campus community can fulfill the academic mission of the university.

Besides the Cantú Queer Center, there are two queer spaces on campus tucked within McHenry Library: the GLBTI Reading Room on the 4th Floor, and the Gloria Anzaldua Reading Room on the 3rd Floor. Both spaces have beautiful displays that will make you feel at home. You can drop by and use these rooms if they are available or reserve them for individual or group use.

The Cantú Queer Center is open Monday through Friday; usual hours are 9 a.m. to 5 p.m. You can reach the center at (831) 459-2468 or via email at queer@ucsc.edu. The Cantú Queer Center website provides an overview.

Women's Center

The Women's Center is devoted to helping students maximize their academic and personal success at UCSC. The center is a student-run resource center that creates and sponsors student-oriented programs, workshops, writing collectives, film screenings, and discussions throughout the academic year. Topics addressed include women's leadership and empowerment, gender and sexuality, race and culture, health and wellness, reproductive rights, advocacy to end sexual violence, and much more. Center staff are available as a resource for on- or off-campus referrals and informal advising.

All students are encouraged to get involved in the center's annual events, which include Sister Solidarity: Women's Heritage Month, Take Back The Night, and more. Other opportunities for involvement include volunteering and work-study paid internships. The center is the ideal space to study, take a break from classes, check out a book from the lending library, and connect with the women's community.

The Women's Center is located at the Cardiff House, an historic farmhouse near the Carriage House in the lower campus. Center hours are Monday through Friday, 9:00 a.m. to 5:00 p.m. For more information, please contact (831) 459-2072, email women@ucsc.edu, or visit the Women's Center website.

The Student Union

The Student Union is a student-governed facility where students can study, take a break and lounge, meet friends, play pool, use computers, or watch television. Located in the Quarry Plaza across from the Bay Tree Bookstore, the Student Union complements college facilities by providing a centrally located place for social, recreational, and educational gatherings for all students and members of the campus community.

The Student Union is also home to the campuswide student governing body (Student Union Assembly) and to student organizations, the Bike Co-op, Engaging Education, and Student Organization Advising and Resources (SOAR).

The Union is open Monday through Thursday 9 a.m. to 9 p.m., Friday 9 a.m. to 6 p.m. The Union is closed holidays and quarter breaks. For more information, call (831) 459-3167.

Student Activities

Campuswide Student Activities: SOMeCA

SOMeCA brings together three dynamic areas of campuswide student engagement: Student Organization Advising and Resources (SOAR), Student Media, and Cultural Arts and Diversity. The organizations and programs of SOMeCA offer students a place of self-discovery. SOMeCA's professional and experienced staff offers mentorship, leadership training, organizational development advising, and project management to all students. Visit the SOMeCA website for more information.

Student Organization Advising and Resources (SOAR)

UCSC offers the student body over 180 student-initiated organizations including academic, cultural, environmental, political, professional, religious, service, and Greek-letter organizations. Students who are actively involved in a student organization gain valuable and transformative leadership skills ranging from conflict mediation to project planning.

Student organizations create a number of events from general body meetings to well-established major scale programming. For example, student leaders host high school students to encourage and support their entrance into college. Others produce major campuswide events to raise funds for cancer research and local community nonprofits. Performing arts organizations perform at conferences and competitions across the country. Student leaders gain real-world experience grounded in the knowledge, values, and skills necessary for navigating the global workplace and engage in dynamic civic participation.

Student organization membership is open to all UCSC students. Learn more at the Student Organization Advising and

Resources (SOAR) office. Contact SOAR at (831) 459-2934, email soar@ucsc.edu, or visit the SOAR website. SOAR is located on the second floor of the Student Union. (During COVID-19 restrictions, please visit our website to check for accessibility.)

Student Media

Student Media at UC Santa Cruz include print publications and broadcast organizations. Every year, hundreds of students enrich their educational experience through internships, academic credit, fellowships, and employment opportunities with media organizations.

The award-winning student newspaper of record, *City on a Hill Press*, covers campus and local news, sports, music, and offers art reviews and commentary. *Fish Rap Live!* provides an alternative forum for free expression of ideas, humorous coverage of local and campus events, and personal journalism. TWANAS, the Communities of Color and Native American Students Press Collective, publishes a news magazine that broadens awareness of perspectives of color in the campus community. Other campus magazines include the critical film journal, *EyeCandy*; *Leviathan Jewish Journal*; *Scientific Slug*, which blends coverage of research on campus with science-focused art and poetry; *Fruitcake*, which looks at life through the lens of graphics and cartoons; the philosophy journal, *Kalopsia*; and *Gaia*, which focuses on environmental issues. Annual literary journals include *Chinquapin*, *Red Wheelbarrow*, *ALAY*, and *Matchbox*.

Artistic, narrative, experimental, documentary, news, and public-service film and video are produced by broadcast organizations, including the Film Production Coalition, On the Spot, Slugworks Animation, Banana Slug Network, and others. Students from all disciplines are encouraged to participate.

To contact student media organizations, call the Student Media Center at (831) 459-2840 or SCTV at (831) 459-5360. Visit the Student Media website for links to print, radio, and broadcast organizations.

Cultural Arts and Diversity (CAD)

Cultural Arts and Diversity (CAD) strives to enhance the cultural climate of UCSC and its surrounding community by celebrating diversity. CAD fosters the spirit of unity between cultures by providing students with outlets for the creative talents of various cultures through theater, lectures, presentations, and productions. By promoting access to resources and services that support these endeavors, CAD strives to provide cultural awareness and diversity, build collaborative partnerships and community outreach, enhance retention and recruitment efforts, and provide opportunities for leadership and educational development. The Cultural Arts and Diversity Center promotes the following programs:

- African American Theater Arts Troupe
- Rainbow Theater
- Rainbow/African American Theater Arts Troupe Outreach

- Classes offered through Theater Arts and Stevenson College

Contact the CAD Office at (831) 459-1861 or visit the CAD website.

UC Santa Cruz and Systemwide Student Governance

UC Santa Cruz offers a wide variety of opportunities to participate in university governance at the college, campus, systemwide, and national levels. Regardless of what level you choose, participating in student government provides a wonderful opportunity to practice leadership skills, meet others who share your interests, and learn a great deal about yourself and the university.

Student Union Assembly

The Student Union Assembly (SUA) is the undergraduate advocacy organization and the official student voice of UC Santa Cruz. It comprises three representatives from each college government; six elected officers (president, vice president of External Affairs, vice president of Internal Affairs, vice president of Academic Affairs, vice president of Diversity and Inclusion, and vice president of Student Life and Student Advocate); and one appointed representative from each of the following student organizations that represent historically underrepresented people within the UC system: African/Black Student Alliance; Asian Pacific Islander Student Alliance; Queer Student Union; Movimiento Estudiantil Chicano/a de Aztlán; Student Alliance of North American Indians; and Ethnic Student Organization Council. The SUA also provides paid part-time internship opportunities for students. These internships include, but are not limited to, field organizers, treasurers, outreach and publicity, and strategy and planning.

The SUA conducts open meetings every Tuesday at 8 p.m. throughout the academic year. Students interested in advocacy, activism, and politics, as well as those concerned with their own and their friends' lives, are invited to get involved. The assembly operates via issue-specific campaigns and around general campus concerns. In the past, the SUA has formed campaigns around fighting fee hikes, defending affirmative action, saving financial aid on a national and state level, striving for reasonable campus growth, and reforming UC Regents' procedures. Current issues include fighting to make a UC education affordable, fighting to stop balancing budgets on the backs of students, fighting for the rights of UC workers, and working with community groups because UCSC students are also Santa Cruz residents. The SUA also works with the UC Student Association and the United States Student Association on systemwide, statewide, and national issues. For more information, visit the SUA website.

Systemwide Student Government: UCSA

The UC Student Association (UCSA) is the statewide association of graduate and undergraduate student governments from the 10 UC campuses. UCSA is the officially recognized voice of the students to the UC Board of Regents, various UC administrative offices, and the UC Office of the President.

Issues covered by UCSA include UC fees and financial aid, comprehensive admissions policies, and academic policies, as well as broader issues of social responsibility such as environmental concerns and civil rights.

The SUA office provides grassroots membership and support for the two main UCSA offices in Oakland and Sacramento. The campus office organizes students to run the grassroots campaigns that are adopted each summer during the UCSA Congress. At this session, delegates from the 10 UC campuses come together and choose the critical issues to be worked on for the next year. Issues in the past have included voter registration drives, letter-writing campaigns on particular UC issues, and increases in financial aid. UCSA provides a thorough introduction to UC politics and student representation. Students may also serve on systemwide committees through UCSA and gain a wide knowledge of the entire UC system through their service.

Two officers help to coordinate UCSA activities on our campus. The Student Union Assembly vice president of external affairs (VPE) is the official representative to the UCSA Board of Directors. This position has voting rights for UCSC, is the primary contact regarding all UCSA issues, and coordinates all lobbying of UCSA and local, state, and federal governments on behalf of UCSC students. The organizing director (OD) coordinates with the VPE to effectively run the grassroots campaigns that are sponsored by UCSA each year. These positions are elected for one-year terms during spring quarter every year.

The Student Union Assembly's VPE may be contacted at sva@ucsc.edu.

College Student Governments

Each college has its own student government, encouraging students to participate in program development and implementation, as well as determining where college membership fees should be allocated. Student governments give students a voice at the college and with the campuswide student government. Like the colleges themselves, each college governing body has its own character, structure, and meeting times and dates. For information, contact the programs coordinator at your college.

The Graduate Student Association (GSA)

The Graduate Student Association (GSA) advocates for graduate student interests with regard to tuition and fees, health insurance, transportation, housing, graduate student well-being, support for marginalized grad students, and other important issues. The GSA ensures graduate student representation on campus committees and works with the campus and UC administration to implement GSA Council goals. The GSA also works with state- and UC-wide bodies to represent the UCSC graduate community beyond our campus. The GSA awards research and travel grants to graduate students in order to provide funding for professional development, cover the cost of supplies, subscriptions, and books needed for research, and to assist with funding travel for conferences, research, and workshops. The GSA also organizes and co-sponsors events for

graduate students, including international grads and grads from historically marginalized communities.

The GSA is funded by student fees and operated by an Executive Board. Representatives from departments that offer graduate degrees make up the GSA Council. The Council meets three times per quarter to strategize around and discuss issues that impact graduate students. For more information, contact the GSA website or email gsainfo@ucsc.edu.

Student Representation on Campuswide Committees

Serving on a campus advisory committee is a recognized channel for student involvement in the university's decision-making processes. Advisory committees composed of faculty, staff, and student representatives are established to develop and recommend policies on a wide range of topics. Each year the Student Committee on Committees (composed of one student appointed by each college and chaired by the Vice President of Internal Affairs of the Student Union Assembly) nominates more than 100 students to serve on over 50 administrative and Academic Senate committees. For information about the selection process, see the Student Union Assembly website or email gsainfo@ucsc.edu.

Community Service Opportunities

Community service is a vital part of the university's mission. It is possible for individual students, as well as campuswide student organizations, to develop service projects that link the university with the broader Santa Cruz community. With the financial support of the campus' Community Service Project funding, students have aided local groups such as Students Toward Achievement in Writing Success, the Strange Queer Youth Conference, and the Walnut Avenue Women's Center.

The Student Volunteer Center, located in the Dean of Students Office at Hahn Student Services, connects students with local volunteer opportunities based on skills and interest. Volunteer opportunities range from aiding youth and elderly to addressing homelessness and environmental issues. The Student Volunteer Center also sponsors events for the campus community where students can volunteer their time.

For more information about service opportunities, see the Student Volunteer Center website, call (831) 459-3363, or email volunteer@ucsc.edu.

Campus Cultural Programs

Throughout the year, UCSC offers frequent and varied cultural opportunities. Students, faculty, and staff may participate as audience members, performers, or behind-the-scenes support crew. The considerable range of offerings includes art exhibits, lectures, films, concerts, recitals, and dance and drama presentations. Programs vary from single performances to weeklong cultural celebrations. The colleges host a number of events, and the departments frequently engage speakers of particular academic interest to address the campus community or present lecture-demonstrations.

The Arts Division serves as a gateway to the entire university, presenting high-quality research and work by faculty, students, and guest artists. Art exhibitions, film screenings, digital arts presentations, music recitals, as well as theater, dance, and music presentations, are offered in conjunction with the academic programs. The Arts Division also offers regular public lectures and colloquia to introduce audiences to professional practitioners and scholars in the traditional and digital arts.

In addition to attending Arts Division activities, UCSC students are invited to participate in a wide variety of division activities that are open to all UCSC students. Join an Indonesian gamelan ensemble, sing in the UCSC Concert Choir, play in the UCSC Orchestra, or audition for a theater or dance production.

For up-to-date information about cultural offerings from the Arts Division, contact the Arts Division Events Office at (831) 459-2787 and visit online at arts.ucsc.edu and on Facebook.

Bay Tree Bookstore

UCSC's Bay Tree Bookstore is located in the Quarry Plaza complex in the center of campus, at the intersection of Hagar Drive and Steinhart Way. The bookstore serves as the campus resource for UCSC course materials, including new and used course books and customized faculty publications; general reading and reference books; a wide variety of school and personal supplies (including computers and computer supplies); and many other items such as residence hall living needs, small appliances, backpacks, UCSC emblematic apparel, art supplies, posters, gifts, greeting cards, testing supplies, and academic regalia. Services include online reservations for course materials, textbook rentals, student debit accounts, special ordering of books, book buyback services, fax services, passport processing, and limited check cashing. The bookstore also houses the campus's convenience store (the Express Store), Student ID Card Services, and a self-service postal kiosk. For more information, call (831) 459-4544, or see the Bay Tree Bookstore website.

Child Care and Early Education Services

Child Care and Early Education Services offers programs for children of students currently enrolled in classes at UCSC. Our center is located on campus near the West Entrance in Family Student Housing. Free or low-cost tuition rates are available for students who meet the eligibility requirements for subsidized care (please see the Eligibility for State Funding Chart at child care). All meals are included in the program (breakfast, lunch, and afternoon snack).

Our programs are dedicated to providing the highest quality developmental care possible in a secure, homelike environment characterized by warmth, affection, and support. The classrooms stress the importance of meeting children's needs in all areas of development: social, emotional, physical, cognitive and creative. Our program emphasizes nature-based learning incorporating the beautiful UCSC campus environment, garden activities, outdoor play, all supporting a S.T.E.M. curriculum.

Programs are open to all children without regard to religion, color, ethnicity, gender, and physical or mental ability. All of

our centers are located in the Family Student Housing Complex. Each center is open most days during the academic year from September through June, and closed during the summer months, administrative and university holidays, and staff development days. In addition, Early Education Services will run a modified program during the summer months. All of the child care spaces are provided for children of student families only. The majority of the spaces are reserved for students who meet the qualifications for subsidized care. Fee-for-service spaces at a below market rate may be available for student families whose income exceeds state-subsidy requirements.

Information about programs, fees, and applications is available at child care and at the Early Education Services Office in the Community Building at Family Student Housing; at (831) 459-2967, or by email at earlyeducation@ucsc.edu.

Infant-Toddler Center

The Infant-Toddler Center serves children ages 11 to 36 months. Small groups, low child-to-adult ratios, and primary caregivers ensure consistent and nurturing care. The hours of operation are 7:30 a.m. to 5:30 p.m.

Preschool Center

The preschool classroom serves children from three years of age until they enter transitional kindergarten. The classroom provides small groups with low child-to-adult ratios, and an environment that supports a stimulating and rich curriculum that helps prepare children for kindergarten. The hours of operation are 7:30 a.m. to 5:30 p.m.

School Age Center

The School Age Program provides an after-school recreation program for children during the academic year. The program provides developmentally appropriate arts and crafts, life skills and sports activities, occasional community outings and quiet time for homework. The hours of operation are 12:30 p.m. to 5:30 p.m. for kindergarteners; and 2:30 p.m. to 5:30 p.m. on Mondays, Tuesdays, Thursdays, and Fridays for 2nd through 5th graders. On Wednesdays (public school minimum days), care is available from 12:30 p.m. to 5:30 p.m. for all school-age children. Extended care is available on a sign-up basis on some Santa Cruz City Schools closure days (university closure days excluded).

UC Santa Cruz Alumni Programs

From the moment you step on campus you become part of the UC Santa Cruz community. As you finish your education and in the redwoods One day you will transform from student to alumni. You are a Banana slug for life!

The UC Santa Cruz Alumni community is a dynamic, innovative, successful, philanthropic, and world-changing network of individuals scattered around the world. With the graduating class of 2021, the UCSC alumni network grew to 140,000 strong. By the time you graduate and join our dynamic, change-making alumni network, it will be even stronger.

There are more than 2 million University of California alumni

making amazing impacts around the globe as leaders and contributors in their communities, of which you will one day be included. UCSC alumni are advocates, volunteers, supporters, friends, and ambassadors for their alma mater, supporting current students like you.

Get to know your UCSC alumni community. They are here to support you on your journey. They've been where you are and know how to help. Visit the alumni.ucsc.edu website and learn more now while you are a student. The sooner you make these lifelong connections, the more opportunities will open up for you.

When you graduate from UC Santa Cruz, you will have abundant opportunities to stay involved in the UCSC community through career and social networking, mentoring students like you, enjoying events, and sharing out of your success by volunteering and giving. Alumni stay connected through online alumni networks, regional groups, social media, the exciting Alumni Weekend, and more.

Your UC Santa Cruz Alumni Association is on a mission to support UC Santa Cruz, build robust connections between students and alumni, connect alumni where their passions are, and strengthen the alumni network throughout the UC Santa Cruz community for personal and professional advancement. The alumni network supports students and alumni through the many pivotal moments in life.

UC Santa Cruz Alumni promotes excellence through scholarships and awards each year, including the Alumni Association Scholarship, College Service Award, Graduate Student Awards, and Leadership Service Awards. Alumni enrich the campus's intellectual life. We recognize and celebrate notable alumni in the UC Santa Cruz community, and present two annual awards: the Alumni Achievement Award and Outstanding Staff Award. UC Santa Cruz publications are filled with alumni success stories. You can read about many of our notable alumni at Alumni Profiles. We look forward to seeing your face among these profiles. Get to know your alumni community and how we are here for you at the UC Santa Cruz Alumni website.

University Interfaith Council

Find your spiritual home at UC Santa Cruz. The University Interfaith Council (UIC) is comprised of 24 groups including Christian, Jewish, Muslim, Buddhist, Sikh, Pagan etc. A full list of the council's member groups is below and online at www.ucscUIC.org, which can help get you connected with the group of your choice.

Member groups are: Sangha Shantivanam, Asian American Christian Fellowship, Chabad, Christian Challenge, Community Seed Earth Spirit Fellowship, Ekklesia, FEAST, FPMT Buddhist Centers, Graduate Student Christian Fellowship, High St. Comm, Hillel, International Students Inc., Newman Catholic, Muslim SA, Latter Day Saints, InterVarsity Christian Fellowship, Klesis, Kyrie, Lutheran, Muslims Student Assoc., Sikh, Soon Movement, Vintage Faith, and Young Life.

GRADUATE INFORMATION

In this section:

Graduate Admission (p. 1245)

Graduate Expenses (p. 1245)

Graduate Academic Program (p. 1247)

Campus Life (p. 1248)

UC Santa Cruz offers graduate study in more than 40 academic fields. Graduate programs encourage close working relationships between students and faculty to promote rapid learning and professional growth. Many graduate programs have interdisciplinary components, and students are encouraged to explore connections between fields as they acquire mastery in their areas of specialization.

There are extensive opportunities for graduate students to engage in significant independent study and research (see Resources for Learning and Research (p. 1250)). Graduate students are also encouraged to obtain teaching experience, primarily as supervised teaching assistants. They are highly valued members of the UCSC community, contributing substantially to the research and teaching conducted on the campus.

GRADUATE ADMISSION

APPLICATION FOR GRADUATE STUDIES

Applications for admission to UC Santa Cruz graduate programs are available online. Applications for the upcoming academic year are available starting October 1 of the prior year.

Instructions and requirements for admission to UC Santa Cruz are posted on the Graduate Admissions website. Please read all instructions thoroughly.

Deadlines vary by program and are posted online.

Please contact the program you are applying to with questions about the application. If there are any problems with the online application, please email gradadm@ucsc.edu; technical questions or issues can go to gradapphelp@ucsc.edu.

GRADUATE EXPENSES

Fees and Expenses

Tuition, fees, and other charges are subject to change without notice by the Regents of the University of California. For current fee information, check registration fees and graduate student budgets. Some or all instruction for all or part of the Academic Year may be delivered remotely. Tuition and fees have been set regardless of the method of instruction and will not be refunded in the event instruction occurs remotely for any

part of the Academic Year. Figures for tuition and fees represent currently approved or proposed amounts and may not be final. Actual tuition and fees are subject to change by the University of California as determined to be necessary or appropriate. Final approved tuition and fee levels may differ from the amounts presented.

For information on fee refunds, see Finances (p. 1192).

Students should not plan to undertake graduate study without assured funding, since outside employment in the Santa Cruz community can be difficult to obtain.

Financial aid recipients should note that fellowship, grant, and loan checks or bank deposits in excess of university charges are refunded to students via direct deposit or check, but are not available to you until the first week of instruction each quarter.

The Student Services Fee supports student services that provide a supportive and enriching learning environment and that are complementary to, but not part of, the instructional program. Programs include, but are not limited to, services related to the physical and psychological health and well-being of students, social and cultural activities and programs, services related to campus life, and educational and career support.

Tuition helps support student financial aid and related programs; administration; libraries; operation and maintenance; the university's operating budget; and all costs related to instruction, including faculty salaries.

Campus-Based Fees help support a wide range of student services, including extracurricular programs, campus child care, community and public service projects, and free-fare use of the local transit systems.

In addition, all students are assessed a mandatory Health Insurance Premium. The Cowell Student Health Center provides primary care services for the plan, while a contracted insurance company provides major medical and hospitalization insurance. Dependent coverage is also available. Detailed information is on the UCSC Student Health Insurance website, or contact (831) 459-2389.

Waivers from the mandatory insurance fee are available for students who can show that their outside plan provides coverage equal to or better than the student health insurance plan. Deadlines for applying for a waiver can be found on the Health Center website and in the Graduate Student Handbook.

NONRESIDENT TUITION

A resident of a state other than California or of another country must also pay nonresident tuition. See general criteria for residency (p. 1256) elsewhere in this catalog.

Non-U.S. citizens note: Regardless of how long you live in California, only U.S. citizens and holders of immigrant visas may become qualified for resident classification.

LATE FEES

Late fees may be assessed if a student fails to make university payments or enroll by the specified deadlines. Deadlines are published online in the Graduate Student Handbook and the Schedule of Classes, and they appear on the Statement of Account.

DEFERRED PAYMENT PLAN

See the information under undergraduate expenses (p. 1192).

Graduate Student Budget

Graduate Student Fees 2021-22

	One Quarter	F-W-S Quarters
Student Services Fee (formerly University Registration Fee)	\$376.00	\$1,128.00
Tuition (formerly Educational Fee)	\$3,814.00	\$11,442.00
Campus-Based Fees	\$441.70	\$1,325.10
GSHIP Health Insurance (waivable)	\$1,670.00	\$5,010.00
Total for California Residents	\$6301.70	\$18,905.10
Nonresident Supplemental Tuition (a)	\$5,034.00	\$15,102.00
Total for Nonresidents of California	\$11,335.70	\$34,007.10

(a) A limited number of Nonresident Tuition Fellowships are available. Please refer to the Financial Support (p. 1246) section.

The tuition and fees posted here are estimates based on currently approved amounts. These figures may not be final. Actual tuition, fees, and charges are subject to change by the Regents of the University of California and could be affected by increases or reductions in State funding, or other developments. Accordingly, final approved levels (and thus a student's final balance due) may differ from the amounts shown. For information on fee refunds, see Fees and Expenses (p. 1245).

Minimum annual expenses, including registration fees, for a single graduate student living on campus are estimated to be \$45,098.00 per academic year. Students should not plan to undertake graduate study without assured funding, since outside employment in the Santa Cruz community can be difficult to obtain. An estimated sample student budget for the 2021-22 academic year is provided below. Non-California residents should add \$15,102 in nonresident tuition and fees to the total.

Graduate Student Budget, 2021-22

Fees	\$18,905.10
Books and supplies	\$645.00
Room and board (on or off campus) (a)	\$21,495.00
Transportation (b)	\$1,773.00
Personal	\$2,280.00
Total	\$45,098.10

a) Estimated room and board for graduate students living with family is \$5,835.

b) Expenses of owning a car and parking on campus are not included here. For parking fees, see Transportation and Parking Services.

c) Some graduate programs are also assessed a professional fee.

Financial Support

The University of California, Santa Cruz, makes a strong effort to provide financial support to all graduate students who make normal progress in their program of studies. Certain kinds of support are awarded on the basis of academic merit, and others are granted on the basis of need. Students are encouraged to apply for both kinds of assistance by submitting the Free Application for Federal Student Aid (FAFSA). This form must be submitted after October 1 prior to the academic year for which you are requesting aid. The FAFSA may be filled out online and filed electronically at the FAFSA website. Applications for student loans for each academic year will be accepted until April of that academic year. More detailed information about the application process and loans can be found at Financial Aid. Students may also visit the Financial Aid and Scholarships Office, 205 Hahn Student Services Building, or call (831) 459-2963.

Beginning in fall 2020, UC Santa Cruz will be offering new and continuing doctoral and MFA students support packages of 5 years (2 for MFA) with a minimum level of support equivalent to a 50% teaching assistantship. In total, this program will bring support for eligible doctoral and MFA students—stipend, fees, tuition, GSHIP, etc.—up to approximately \$43,000 annually.

FELLOWSHIPS, ASSISTANTSHIPS, GRANTS

Students who received **Cal Grant A or B** as undergraduates within the last 15 months may request a one-year extension from the California Student Aid Commission to attend a teacher credential program. Renewal of these awards requires the student to submit the FAFSA by March 2nd. In addition, the student must submit a Request for Teaching Program Benefits Form (Form G-44) to the California Student Aid Commission.

The federal **Teacher Education Assistance for College and Higher Education (TEACH) Grant Program** provides grants to students who intend to teach in a high-need field in a

public/private elementary or secondary school that serves students from low-income families. The program at UCSC is for M.A. Education students. In exchange for receiving this grant, you must sign an Agreement to Serve and complete online counseling. This grant converts to a loan with retroactive interest if the Service Agreement is not fulfilled. More information and a fact sheet can be found at the Federal Student Aid TEACH Grants website.

Teaching Assistantships are offered by academic departments. Departments may decide to assign assistantships to students outside of the department. Opportunities are shared among departments and students should inquire with their graduate department adviser about applying for assistantships. Salary information is posted online by the Academic Personnel Office.

Graduate Student Researcher Internships are assigned by faculty and sponsoring campus agencies. Students should inquire with faculty about GSR opportunities. Salary scales (steps) vary by department/division. Salary information is posted online by the Academic Personnel Office.

STUDENT LOANS

Graduate students can qualify for federal student loans by completing the FAFSA. Graduate students are eligible for Unsubsidized and Graduate PLUS loan programs. For additional information, see the UCSC Financial Aid and Scholarships website.

LOAN FORGIVENESS PROGRAMS

The federal government will forgive all or part of a student loan under certain circumstances. This can include performing volunteer work or military service, or practicing medicine in certain communities. For a summary of such exemptions, visit the Federal Student Aid website.

GRADUATE ACADEMIC PROGRAM

Degrees and Programs

UC Santa Cruz offers graduate programs leading toward the following degrees: master's of arts, master's of sciences, master's of fine arts, doctor of musical arts, and doctor of philosophy. See our full list of programs and read about each program's application requirements.

Administration

At UC Santa Cruz, individual graduate programs are directed by the academic departments. Overall policy is determined by the Graduate Council, and coordination and record keeping for matters common to all graduate students—such as admission applications, fellowships, and advancement to candidacy—are the responsibility of the Division of Graduate Studies. The dean

of graduate studies is the chief administrative officer. Graduate policies and other information can be found online in the Graduate Student Handbook.

Catalog Rights

Students matriculating in a given graduate program will select the UCSC General Catalog they will follow to meet their requirements; either the catalog published the year they enter the program, or any subsequent catalog published prior to the year they are awarded the degree sought. Students who seek readmission after a break in attendance of more than two years (six regular quarters) must adhere to the graduation requirements in effect at the time of readmission or to those subsequently established for all portions of the degree requirements not already fulfilled. The readmitting program will determine which degree requirements remain to be fulfilled. A student must follow the chosen catalog in its entirety, including both the individual degree program and general university requirements. General university requirements may be found in the Graduate Student Handbook.

Evaluation of Performance

Graduate students are graded Satisfactory/Unsatisfactory (S/U), or by request A, B, C, D, F. The grades A, B, or S are awarded for satisfactory work. A grade of C, D, or U will not satisfy requirements for the graduate degree. Courses in which a graduate student receives a grade of C, D, F, or U may be repeated. Credit points will be counted once, and the most recently earned grade will determine whether a degree requirement has been met. Repeating a course more than once requires the prior written approval of the dean of graduate studies.

Graduate student performance may also be evaluated according to the Narrative Evaluation System. Evaluations may be used by academic advisers and become part of the student's official academic record. Read the FAQs for Students: Evaluations for an explanation of the narrative process.

Please also refer to the statement on Academic Integrity; Appendix F, Graduate Student-Faculty Adviser Relationship Guidelines; and Appendix O, Official University Policy on Academic Integrity for Graduate Students, published in the Student Policies and Regulations Handbook.

Duplication of Higher Degrees

It is the policy of UC Santa Cruz campus to prohibit the pursuit of duplicate advanced degrees. However, applicants may petition the graduate dean for an exception to this policy if the degree sought is in a field of study distinctly different from the field in which the original advanced degree was attained.

In order for a student who already holds the doctorate to be admitted or readmitted to work toward a second Ph.D.—or toward an academic master’s degree—each of the following conditions must be met:

- The applicant must petition the graduate dean in writing prior to the application deadline for the program in question.
- The department sponsoring the program to which admission is sought must support the applicant’s petition.
- The department must present the graduate dean with a clear and complete outline of the program required for the degree sought, and must explain the intellectual separateness of the proposed program from that completed by the applicant in attaining the earlier degree.
- The graduate dean will review all materials submitted and decide whether or not to admit the applicant, consulting with the Graduate Council when appropriate.

Admission to a professional master’s program after a Ph.D., or to an academic master’s program after a professional doctorate, is not subject to these restrictions.

Transfer of Credit

UC Santa Cruz does not automatically grant credit for graduate-level work undertaken at other universities. Each department determines credit transferability on an individual basis.

CAMPUS LIFE

Diversity-Enhancement Programs

The Eugene Cota-Robles Fellowship and the Dissertation-Year Fellowship are part of the University of California’s Academic Career Development Program.

The Eugene Cota-Robles Fellowship is a merit-based diversity-enhancement program that provides financial support for students from diverse backgrounds to pursue and successfully complete a graduate degree. This fellowship is awarded to entering doctoral students who have overcome significant obstacles to achieve a baccalaureate-level degree, and whose economic, educational, or social background contributes to intellectual diversity of the graduate student population. Departments identify applicants from among their pool of admissions applications. Applicants should refer to the information under Financial Support in the application to gain a better understanding of this fellowship. Fellowship recipients must be U.S. citizens or permanent residents.

The Dissertation-Year Fellowship is available to continuing students who are advanced to candidacy. Enrolled students are assisted through formal and informal group orientations, individual advice about academic matters, financial aid, postdoctoral opportunities, and the provision of information about career planning, health care, and housing.

Departments nominate applicants for this fellowship from among their qualified students. For information, see the Division of Graduate Studies website.

Student Life

The campus offers a variety of programs to enhance the quality of student life, all of which are available to graduate students. These include child care, sports and recreation, health services, cultural events, transportation services, and the UCSC Women’s Center. See undergraduate Student Life (p. 1221) for information on these services and a description of the local community. See Disability Resource Center for services available to students with disabilities.

Graduate Student Association

The Graduate Student Association (GSA) is an organization of all graduate students at UCSC.

The GSA advocates for graduate student interests with regard to tuition and fees, health insurance, transportation, housing, graduate student well-being, support for marginalized grad students, and other important issues. The GSA ensures graduate student representation on campus committees and works with the campus and UC administration to implement GSA goals. The GSA also works with statewide and UC-wide bodies to represent the UCSC graduate community beyond our campus.

The GSA awards research and travel grants to graduate students and also organizes and co-sponsors events for graduate students, including international graduate students and grads from historically marginalized communities.

The GSA is funded by student fees and operated by an executive board. Graduate students elect representatives from departments which offer graduate degrees to participate on the GSA Council. The council meets three times per quarter to strategize around and discuss issues that impact graduate students. For more information, contact the GSA website or email gsainfo@ucsc.edu.

Graduate Student Commons

Located in the Quarry Plaza, the Graduate Student Commons (GSC) serves the needs and interests of graduate students at UCSC. The GSC is open 24 hours a day and is accessible by student ID card.

The Graduate Student Commons offers a wide range of professional development workshops, health and wellness, and social activities each quarter to support graduate students at UCSC. Visit the Graduate Student Commons website to learn about upcoming programming.

Housing

As at all UC campuses, finding housing may be a challenge. Students who wish to reside on campus should submit their application as soon as possible. Likewise, students who wish to

live off campus should start looking at available rentals as soon as possible.

On-campus Graduate Student Housing is available for 82 graduate students. Visit the Grad Housing website, or email gradhsg@ucsc.edu.

Students with families may apply to live in Family Student Housing, a complex of two-bedroom unfurnished apartments. Refer to the Family Student Housing website, or email fsh@ucsc.edu.

To assist students in locating living accommodations in the surrounding communities, the Community Rentals Office maintains a list of available rentals.

Global Engagement

The Global Engagement Office facilitates the exchange of people, ideas, and knowledge to support and promote the internationalization of the teaching, learning, and research at UC Santa Cruz. Global Engagement oversees UCSC Study Abroad, International Student and Scholar Services (ISSS), Global Programming, and Global Initiatives. For further information, contact the Global Engagement Office: 103 Classroom Unit Building, (831) 459-2858, email: global@ucsc.edu.

International Student Scholar Services

International Student and Scholar Services (ISSS) provides immigration advising and advocacy as well as cultural and academic programming for UCSC's growing global community. ISSS assists students, scholars, researchers, and faculty members in maintaining their legal status while in the United States, serving as UCSC's official liaison to U.S. government agencies related to immigration matters. For information, see the ISSS website.

Fulbright Grants for Graduate Study and Research Abroad

The Global Engagement Office facilitates the Fulbright annual awards competition for the Graduate Study and Research Abroad Program for currently enrolled UCSC students. For more information, see the Global Engagement Office website.

Study Abroad

UCSC Study Abroad offers undergraduate and graduate students the opportunity to study through the University of California Education Abroad Program (UCEAP) as part of their regular UCSC academic program, with more than 400 programs in more than 40 countries. UCEAP serves students at all UC campuses. Study Abroad also assists students participating in study-abroad opportunities through UCSC directly, through other UC campuses, and through privately sponsored organizations. Study Abroad seeks to bring these programs within reach of all students.

RESOURCES, RESIDENCY, AND POLICIES

In this section:

Resources for Learning and Research (p. 1250)

University Administration (p. 1284)

California Residence and Nonresident Supplemental Tuition (p. 1256)

Policies (p. 1258)

RESOURCES FOR LEARNING AND RESEARCH

In this section:

University Library (p. 1250)

Natural Reserve System (NRS) (p. 1250)

Computing Facilities and Technology Services (p. 1251)

Arts Division (p. 1251)

Baskin School of Engineering (BSOE) (p. 1252)

Humanities Division (p. 1254)

Physical and Biological Sciences Division (p. 1255)

Social Sciences Division (p. 1255)

University Library

The UC Santa Cruz University Library supports the research and learning needs of the campus community from two locations: McHenry Library at the center of campus, and the Science and Engineering Library on “Science Hill.” The Library is a second home for many students, providing space for individual quiet study as well as reservable group study spaces. Each library’s Information Commons offers computer workstations, scanners, and printers as well as circulating laptop and Chromebook computers. McHenry Library hosts the Global Village Café, a perfect place to recharge during marathon study sessions.

The University Library provides access to a wide variety of scholarly resources. Access to eBooks, eJournals, and streaming media is available on campus and off, the latter via the campus’s Virtual Private Network. While the majority of the Library’s print materials are housed in open stacks and accessible to all faculty, students, and staff, the campus community also has access to millions of other books and journals through shared licensing and the Interlibrary Loan service.

The Reserves service lends copies of assigned class readings and media on a short-term basis so that all students can access the course materials they need to succeed.

Special Collections acquires and manages rare book and primary source collections that are accessible to students,

faculty, and the general public. Holdings include a significant book collection including an unusually large number of artists’ books, fine press, and early printing, as well as over 500 archival collections, with particular strengths in 20th century photography, literature, art, music, and astronomy.

The David Kirk Digital Scholarship Commons (DSC) at McHenry Library provides access to new work spaces and high-end computer software. The DSC invites all members of the UCSC community to build digital and web-based projects, collaborate on research, and experiment with innovative tools and methods.

Other important collections and services include:

- The Digital Collections website contains a growing treasury of digitized photographs, maps, artwork, oral history transcripts, and sound recordings, as well as “born digital” materials, focusing on the most rare and unique collections.
- The Video Game Lab at the Science and Engineering Library provides access to more than 2,000 games and 30 gaming consoles as well as books to support game design and studies.
- The Ask-A-Librarian service provides expert in-person and online research assistance.

For more information, see the University Library website.

Natural Reserve System (NRS)

The University of California administers 39 natural reserves throughout the state. UC Santa Cruz has responsibility for four—the Landels-Hill Big Creek Reserve, Fort Ord Natural Reserve, Año Nuevo Island, and Younger Lagoon Natural Reserve—in addition to UCSC’s own Campus Natural Reserve. The purpose of the NRS is to establish and maintain, for teaching and research, a system of natural areas that encompass diverse and undisturbed examples of California’s terrain, both aquatic and terrestrial. The reserves are open to all qualified individuals and institutions for scholarly work concerned with the natural environment. Such work usually deals with ecological topics or experimental studies in a natural setting.

At UCSC, the reserves play an important role in supporting experiential learning (course support, internships, and research support) for undergraduate students interested in the ecological, physical, and environmental sciences. The close proximity of two of the reserves (Campus Reserve and Younger Lagoon) makes it possible for faculty and students to walk out the classroom door and into a living laboratory and outdoor classroom. These two reserves serve over 3,500 students, dozens of courses across multiple disciplines, and 150 undergraduate internships each year.

Information about the reserves is available at the UC Santa Cruz Natural Reserves website. Information about the UC system’s NRS holdings and management is available at the University of California Natural Reserve System website. You

may also contact the UCSC Natural Reserve director, c/o Environmental Studies Department, 467 Natural Sciences 2 Building, at (831) 459-4867, or by email at ghdayton@ucsc.edu.

Computing Facilities and Technology Services

INFORMATION TECHNOLOGY SERVICES (ITS)

Information Technology Services (ITS) at UCSC provides a broad spectrum of IT-related resources, services, and support to students, faculty, and staff in the areas of computing, network, telephones, media services, information systems security, web, email, and instructional technology.

ITS operates the campus network, which interconnects computers, workstations, instructional computing labs, and computer-equipped classrooms with each other and the Internet. In addition, wireless access is available across campus. ITS also provides the campus with technical services and computer support through the ITS Support Center.

PURCHASING A COMPUTER?

If you are planning on buying a new computer, UCSC recommends purchasing a laptop with both wired and wireless network capability. The campus supports both PC and Mac computers. An excellent source for purchasing computers and computer products is the campus Bay Tree Bookstore, (831) 459-2082. Through university-negotiated contracts, pricing is almost always below outside market prices.

UCSC ACCOUNT (CRUZID) AND EMAIL

All students, faculty, and staff have a UCSC account called CruzID and a UCSC email account powered by Google. Your CruzID is part of your email address, e.g., cruzid@ucsc.edu. All official UC and UCSC communication is emailed to the @ucsc.edu address. In addition to email, CruzID gives individuals access to many campus systems and applications. More information is available at UCSC Email Services.

RESIDENTIAL NETWORK

ITS provides in-room Internet access (called ResNet) to students living on campus. Network services are available to undergraduate and graduate students living in university housing (except for the Camper Park). For assistance with network connections, contact ResNet at resnet@ucsc.edu or call (831) 459-HELP (4357).

COMPUTING LABS FOR DROP-IN USE AND ACADEMIC CLASSES

ITS manages 12 computer labs throughout the campus. These labs have more than 300 computers available for students to use that include PC, Mac, and Sun workstations. Wireless access is

available in all labs. More extensive lab information, including hardware and software specifications and hours of operation, is available at the Computer Labs page.

ACADEMIC COURSE MATERIALS ON THE WEB

Canvas is the campus online course-management system used to create sophisticated web-based course materials to supplement, but not replace, classroom instruction. Canvas uses a web browser as the interface for the course.

Faculty using Canvas can incorporate a wide variety of tools in their course site, such as a course calendar, student conferencing system, electronic mail, group projects with student-created web pages, and quizzes. Outside of class time, students can use Canvas to view course materials, participate in web-based class discussions, collaborate on student group projects, and take quizzes.

DISABILITY ACCOMMODATIONS FOR INSTRUCTION

UCSC computing labs have common adaptive technologies—such as enlarged type for students with low vision and Dvorak keyboards for students with repetitive strain injuries. If you have a disability and require adaptive or assistive technology to use lab computers, library facilities, or other campus services, please contact the Disability Resource Center (DRC) so that they can coordinate services for you. You can also reach the DRC at (831) 459-2089 (voice), or (831) 459-4806 (TTY).

ITS SUPPORT CENTER FOR TECHNICAL AND COMPUTER HELP

The ITS Support Center is open to all students, staff, and faculty and provides general computer help, assistance with CruzID accounts and email, and other technical-support needs. The Support Center is located at 54 Kerr Hall and is open Monday through Friday from 8 a.m. to 5 p.m.

COMPUTING POLICIES

Individuals using UCSC computing services must comply with the University of California, state, and federal policies and laws. These policies define how ITS will approach security, how faculty, staff, and students are to approach security, and how certain situations will be handled.

Arts Division

ARTS DIVISION RESEARCH

CENTERS AND INSTITUTES

Arts Research Institute (ARI)
 Center for Creative Ecologies
 Center for Documentary Arts and Research (CDAR)
 Center for the Study of the Force Majeure
 Contemporary Print Media Research Center
 E.A.R.T.H. Lab
 Innovation and Design Lab (IDL)
 Institute of the Arts and Sciences
 OpenLab Collaborative Research Center
 Social Practice Arts Research Center (SPARC)

in collaborative interdisciplinary centers and institutes, outfitted with modern equipment and instrumentation, and providing opportunities for graduate and undergraduate students to work side by side with world-class engineering faculty.

Facilities and resources include class 100 clean rooms, nanofabrication equipment, modern microscopy facilities, ultrafast optics and single particle spectroscopy labs, an immersive virtual reality CAVE lab, modern gaming equipment, and one of the most advanced stem cell research facilities in the western United States.

ARTS DIVISION TEACHING, RESEARCH, AND PERFORMANCE FACILITIES

Arts Information Technology Services (ITS) Labs (Porter Arts Mac Lab and the Music Lab)
 Digital Arts Research Center (DARC)
 Music Center
 Theater Arts Center

Arts Division Research Centers and Institutes

Arts Research Institute (ARI)
 Center for Creative Ecologies
 Center for Documentary Arts and Research (CDAR)
 Center for the Study of the Force Majeure
 Contemporary Print Media Research Center
 E.A.R.T.H. Lab
 Innovation and Design Lab (IDL)
 Institute of the Arts and Sciences
 OpenLab Collaborative Research Center
 Social Practice Arts Research Center (SPARC)

Arts Division Teaching, Research, and Performance Facilities

Arts Information Technology Services (ITS) Labs (Porter Arts Mac Lab and the Music Lab)
 Digital Arts Research Center (DARC)
 Music Center
 Theater Arts Center

Baskin School of Engineering (BSOE)

The Baskin School of Engineering is known for rigorous engineering research with a focus on engineering for social good. From data science, to life and health and cyber-physical systems, BSOE is shaped around the opportunities and challenges of the 21st century. Much of our research takes place

BSOE RESEARCH CENTERS AND INSTITUTES

California Institute for Quantitative Biosciences (QB3)
 Center for Biomolecular Science and Engineering (CBSE)
 Center for Games and Playable Media
 Center for Information Technology Research in the Interest of Society (CITRIS)
 Center for Research in Open Source Software (CROSS)
 Center for Research in Storage Systems (CRSS)
 Cyber-Physical Systems Research Center (CPSRC)
 Data, Discovery and Decisions in Data Science (D3) Research Center
 Information Technologies Institute (ITI)
 Storage Systems Research Center
 W.M. Keck Center for Adaptive Optical Microscopy
 W.M. Keck Center for Nanoscale Optofluidics

BSOE RESEARCH GROUPS AND LABORATORIES

Advanced Visualization and Interactive Systems Lab
 Applied and Nano-Optics Group
 Autonomous Systems Lab
 Computer Communication Research Group (CCRG)
 Computer Vision Lab
 Geospatial Visualization Laboratory
 Group Researching Advances in Software Engineering (GRASE)
 Hybrid Systems Laboratory
 Information Retrieval and Knowledge Management Lab (IRKM)
 Institute for Scalable Scientific Data Management (ISSDM)
 Institute for the Biology of Stem Cells (IBSC)
 Internetworking Research Group (i-NRG)
 Micro Architecture at Santa Cruz (MASC)
 NanoEngineering Group
 Network Management and Operations Lab
 Robotics and Control Lab

Storage Systems Research Center (SSRC)
 Systems Research Lab
 UC Santa Cruz Genomics Institute
 VLSI Design and Automation Group

Resources for learning and research in the Baskin School of Engineering are augmented by industry partnerships, both in Santa Cruz and Silicon Valley, and by labs and centers across the UC Santa Cruz campus.

BSOE Research Centers and Institutes

California Institute for Quantitative Biosciences (QB3)
 Center for Biomolecular Science and Engineering (CBSE)
 Center for Games and Playable Media
 Center for Information Technology Research in the Interest of Society (CITRIS)
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BSOE Research Groups and Laboratories

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 Autonomous Systems Lab
 Computer Communication Research Group (CCRG)
 Computer Vision Lab
 Geospatial Visualization Laboratory
 Group Researching Advances in Software Engineering (GRASE)
 Hybrid Systems Laboratory
 Information Retrieval and Knowledge Management Lab (IRKM)
 Institute for Scalable Scientific Data Management (ISSDM)
 Institute for the Biology of Stem Cells (IBSC)
 Internetworking Research Group (i-NRG)
 Micro Architecture at Santa Cruz (MASC)
 NanoEngineering Group
 Network Management and Operations Lab
 Robotics and Control Lab
 Storage Systems Research Center (SSRC)
 Systems Research Lab
 UC Santa Cruz Genomics Institute
 VLSI Design and Automation Group

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Humanities Division

RESEARCH PROGRAMS

The Humanities Institute at UC Santa Cruz is a hub for academic research, cross-discipline collaboration, and public engagement. We incubate ideas and foster innovation by funding projects, centers, and research clusters that enable faculty and students to work on some of the biggest problems of our day.

The Institute is a source, resource, and force for humanities-based inquiry and engagement with world events. We're passionate about expanding the field of humanities scholarship with digital tools and an interdisciplinary focus. And we believe strongly that the core subjects of the humanities—philosophy, history, language and literature—should be accessible to everyone. That's why we're committed to engaging with the broadest community possible—from first-generation undergraduate students, to local residents, to anyone interested in compelling ideas and making sense of this increasingly complex world.

As part of the University of California system, the Institute is able to leverage the resources of the finest public university system in the world. Part of what makes the UC system of universities great—and what makes us different from so many universities around the globe—is the central role of the humanities in our educational experience, not only in the curriculum, but also in the vibrant intellectual life of our campuses. Here at UC Santa Cruz, we possess an especially rich tradition of innovation, creativity, and collaboration in the humanities.

Centers include:

Center for Cultural Studies

Center for Jewish Studies

Center for Public Philosophy

Center for the Study of Pacific War Memories

Center for World History

Dickens Project

Digital Humanities Initiative

Gail Project

Language of Conservation Project

Linguistics Research Center

Morton Marcus Poetry Reading

Nido de Lenguas

Shakespeare Workshop

Sikh and Punjabi Studies

Undergraduate students in the humanities actively participate in the work and the activities of the centers and projects above. In addition, The Humanities Institute gives out 10 research fellowships annually to undergraduate students working on humanities projects. The students' work is showcased at the annual divisional award ceremony in the spring quarter.

Research Programs

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Physical and Biological Sciences Division

RESEARCH PROGRAMS AND CENTERS

Center for Adaptive Optics (CfAO) (also see lao.ucolick.org)

Center for Molecular Biology of RNA

Center for Origin, Dynamics, and Evolution of Planets (CODEP)

Institute of Marine Sciences (IMS)

Institute for the Biology of Stem Cells (IBSC)

Microbiology and Biomedical Research

Santa Cruz Institute for Particle Physics (SCIPP)

Santa Cruz Predatory Bird Research Group

RESEARCH FACILITIES AND LABORATORIES

Chemical Screening Center (CSC)

Earth System Computing & Digital Imaging Facilities

Geochemical and Rock Analysis

Geophysical Facilities

Hydrogeology Facilities

Life Sciences Microscopy Center

Macromolecular Structure Function Core Facility (MSFCF)

Marine Analytical Laboratories

Mass Spectrometry Facility

Microarray Facility

Mineral Physics Laboratory

Molecular Ecology and Evolutionary Genetics Facility

Nanosecond Time-resolved Laser Spectroscopy

Nuclear Magnetic Resonance Facility

Scientific Diving and Boating Safety

Shallow Earth Processes Facilities

Stable Isotope Laboratory

UCSC Greenhouses

W.M. Keck Isotope Laboratory

Research Programs and Centers

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Institute of Marine Sciences (IMS)

Institute for the Biology of Stem Cells (IBSC)

Microbiology and Biomedical Research

Santa Cruz Institute for Particle Physics (SCIPP)

Santa Cruz Predatory Bird Research Group

Research Facilities and Laboratories

Chemical Screening Center (CSC)

Earth System Computing & Digital Imaging Facilities

Geochemical and Rock Analysis

Geophysical Facilities

Hydrogeology Facilities

Life Sciences Microscopy Center

Macromolecular Structure Function Core Facility (MSFCF)

Marine Analytical Laboratories

Mass Spectrometry Facility

Microarray Facility

Mineral Physics Laboratory

Molecular Ecology and Evolutionary Genetics Facility

Nanosecond Time-resolved Laser Spectroscopy

Nuclear Magnetic Resonance Facility

Scientific Diving and Boating Safety

Shallow Earth Processes Facilities

Stable Isotope Laboratory

UCSC Greenhouses

W.M. Keck Isotope Laboratory

Social Sciences Division

RESEARCH CENTERS

Center for Agroecology and Sustainable Food Systems (CASFS)

Center for Analytical Finance (CAFIN)

Center for Integrated Spatial Research (CISR)

Center for Labor Studies (CLS)

Center for Research on Equity and Collaborative Evaluation (CRECE)

Center for Statistical Analysis in Social Sciences (CSASS)

Chicano/Latino Research Center (CLRC)

Kenneth S. Norris Center for Natural History

Science & Justice Research Center

UC Santa Cruz Blum Center on Poverty, Social Enterprise, and Participatory Governance

RESEARCH INITIATIVES

Bruce Initiative on Rethinking Capitalism

Everett Program

Institute for Scientist and Engineer Educators (ISEE)

INTERDISCIPLINARY AND SYSTEMWIDE RESEARCH PROGRAMS AND RESOURCES

California Institute for Quantitative Biosciences (QB3)

Center for Collaborative Research for an Equitable California (CCREC)

Center for Information Technology Research in the Interest of Society (CITRIS) and the Banatao Institute

Center for Innovation and Entrepreneurial Development (CIED)

Educational Partnership Center (EPC)

Institute of the Arts and Sciences

Santa Cruz Institute for Particle Physics (SCIPP)

UC Monterey Bay Education, Science, and Technology (UC MBEST) Center

UC Santa Cruz Arboretum & Botanic Garden

University of California High-Performance AstroComputing Center (UC-HiPACC)

University of California Observatories (UCO)

Research Centers

Center for Agroecology and Sustainable Food Systems (CASFS)

Center for Analytical Finance (CAFIN)

Center for Integrated Spatial Research (CISR)

Center for Labor Studies (CLS)

Center for Research on Equity and Collaborative Evaluation (CRECE)

Center for Statistical Analysis in Social Sciences (CSASS)

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Research Initiatives

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Interdisciplinary and Systemwide Research Programs and Resources

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Center for Collaborative Research for an Equitable California (CCREC)

Center for Information Technology Research in the Interest of Society (CITRIS) and the Banatao Institute

Center for Innovation and Entrepreneurial Development (CIED)

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UC Monterey Bay Education, Science, and Technology (UC MBEST) Center

UC Santa Cruz Arboretum & Botanic Garden

University of California High-Performance AstroComputing Center (UC-HiPACC)

University of California Observatories (UCO)

CALIFORNIA RESIDENCE AND NONRESIDENT SUPPLEMENTAL TUITION

RESIDENCY INFORMATION FOR TUITION PURPOSES

The Residence Policy and Guidelines is the main source of residency information and is utilized by the campus residence deputy to make determinations regarding residency. Read the full text of the Residency Policy and Guidelines.

If you do not meet the University of California requirements for residence for tuition purposes on the residence determination date for each term in which you propose to attend the university, you must pay a Nonresident Supplemental Tuition in addition to all other fees. The residence determination date is the day instruction begins at the last of the University of California campuses to open for the quarter.

STATEMENT OF LEGAL RESIDENCE

New undergraduate and graduate students and returning students with an absence of two or more terms must submit a Statement of Legal Residence (SLR). This form is used to determine the fees that will be assessed. Students who do not submit the SLR will be classified as a Nonresident and will be assessed the Nonresident Supplemental Tuition.

PETITIONING FOR CHANGE OF CLASSIFICATION

Continuing students must submit a Petition for Change of Legal Residence Status to the residency deputy by the filing deadline. Late petitions will not be accepted.

TIME LIMITATION ON PROVIDING DOCUMENTATION

If additional documentation is required for residence classification but is not readily accessible, you will have until the third week of instruction of the applicable term to provide it. Failure to meet this deadline will result in your file being closed and your status remaining as a nonresident.

INCORRECT CLASSIFICATION

If you are incorrectly classified as a resident, your classification will be corrected and you will be required to pay all nonresident tuition not paid. If you concealed information or furnished false information and were classified incorrectly as a result, you are also subject to university discipline. Resident students who become nonresidents must immediately notify the campus residence deputy.

INQUIRIES AND APPEALS

Inquiries

All inquiries regarding residence requirements, determination, and/or recognized exceptions should be directed to the Residence Deputy, Office of the Registrar, 190 Hahn Student Services Building, University of California, Santa Cruz, 1156 High Street, Santa Cruz, CA 95064-1077, reg-residency@ucsc.edu, or to the Residence Analyst, University of California Office of the General Counsel, 1111 Franklin Street, 8th Floor, Oakland, CA 94607-5200, or email residency.appeal@ucop.edu.

Appeals

Students denied resident status may file an appeal to the Office of the General Counsel. Appeals must be filed within 30 days of notification of the campus residence deputy's decision.

Instructions and Application to Appeal a Nonresident Classification

RESIDENCY DISCLAIMER

This is only a summary of the UC Residence Regulations and is not a complete explanation of the policy regarding residence classification. Changes may be made to the residence requirements between the publication date of this statement and the relevant residence determination date. Any student, following a final decision on residence classification by the residence deputy, may appeal in writing to the residence specialist within 30 days of notification of the residence deputy's final decision.

No other University of California personnel are authorized to provide information regarding residence requirements.

PRIVACY NOTICE

All of the information requested on the Statement of Legal Residence form is required [established by Regents Policy 3105 as set forth in the UC Residence Policy and Guidelines] for determining whether or not you are a legal resident for tuition purposes. You have the right to inspect university records containing the residence information requested on this form. The records are maintained by the Office of the Registrar, 190 Hahn Student Services Building, University of California, Santa Cruz, 1156 High Street, Santa Cruz, CA 95064-1077.

POLICIES

In this section:

UC Santa Cruz Police Department

UC Santa Cruz Police Department officers are duly sworn peace officers under section 830.2(b) of the California Penal Code. The officers are armed and possess the same authority and responsibility, by law, as those in municipal police departments. Officers patrol the campus 24 hours a day, 365 days a year, on foot, bicycle, motorcycle, or by car. They enforce the law, arrest violators, investigate and suppress crime, investigate traffic and bicycle accidents, and provide a full range of services to the community. For more information about the UC Santa Cruz Police Department, please visit police.ucsc.edu.

Reporting Procedures

It is important that all crimes, emergencies, and/or suspicious, disturbing, or threatening behaviors occurring on campus be immediately reported to the Police Department to ensure that appropriate action can be taken. Emergencies requiring police, fire, or medical aid can be reported in person or by dialing 911 from any campus phone, cell phone, or landline phone. Emergencies can also be reported by using one of the "Blue Light" emergency phones or elevator phones located throughout the campus. If there is a fire and no telephone is available, activate one of the fire alarm manual pull stations located throughout campus buildings.

Individuals may also report in person at the UC Santa Cruz Police Department located at the base of the campus near the main entrance. Activities or incidents occurring outside of the UC Santa Cruz jurisdiction should be reported immediately to the agency having jurisdiction where the property is located. If an individual is uncertain which agency should take the report, UC Santa Cruz Police can help determine which one is appropriate and refer the individual to that agency.

Phone Numbers To Call

- **9-1-1 for any emergency situation with serious threat to life or property.**
- **(831) 459-2345.** If unable to dial 9-1-1 from the phone being used for any emergency situation with serious threat to life or property.
- **(831) 459-4980:** Telecommunications Device for the Deaf, 24 hours.
- **(831) 459-2231:** Ext 1. Non-emergency calls for assistance.
- **(831) 459-2100:** Community Safety Program Dispatch Line, 7 p.m. to 3 a.m. nightly.
- **(831) 459-3TIP or (831) 459-3847:** Anonymous Tip Line.

Lost and Found

The UC Santa Cruz Police Department provides a lost and found service. Only items valued at approximately \$300 or more are accepted, and are kept for 90 days. Exceptions are made for found wallets, cash, driver licenses or identification cards, bank cards, and keys. To drop off a found item or to inquire about a lost item, please visit the Police Department or call (831) 459-2231.

Parking Enforcement

Parking Enforcement is a unit within the Police Department, and parking citations are processed by their Records and Citations office. Citations may be paid or contested online at Paymycite.com 24 hours a day, or in person during business hours.

Community Safety Program

Community Safety Officers (CSOs) work in conjunction with the UC Santa Cruz Police, Santa Cruz City Fire, and the administration of university residential communities (both on- and off-campus) to ensure a safe and secure living environment for all residents.

CSOs work in teams and are trained to assist police and fire departments with emergency response, first aid, CPR, and disaster response, across campus and in all residential communities. They carry radios linked to the UC Santa Cruz Police Dispatch Center and are visible in the communities at night from 7 p.m. to 3 a.m. CSOs may be contacted through the UC Santa Cruz Police Dispatch Center at (831) 459-2100.

Jeanne Clery Disclosure of Campus Security and Campus Crime Statistics Act

Choosing a postsecondary institution is a major decision for students and their families. Along with academic, financial and geographic considerations, the issue of campus safety is a vital concern. In 1990, Congress enacted the Crime Awareness and Campus Security Act of 1990, which amended the Higher Education Act of 1965 (HEA). This act required all postsecondary institutions participating in HEA's Title IV student financial assistance programs to disclose campus crime statistics and security information. The act was amended in 1992, 1998, and 2000. The 1998 amendments renamed the law the Jeanne Clery Disclosure of Campus Security Policy and Campus Crime Statistics Act in memory of a student who was slain in her dorm room in 1986. It is generally referred to as the Clery Act. More information about the Clery Act can be found at: Clery.Center.

Campus Security Authorities

Although UC Santa Cruz has a police department, victims of crime may be more inclined to report to someone other than the police. For this reason the Clery Act requires all institutions to collect crime reports from a variety of individuals and organizations that the Clery Act refers to as Campus Security Authorities (CSA). A CSA is an official of the university who has significant responsibility for student and campus activities.

They are usually found in departments responsible for, but not limited to, student and campus activities, the police department, community safety programs, student conduct/judicial affairs, housing, athletics, or human resources. This designation also includes any other individual who has been specified by UC Santa Cruz to receive reports of offenses.

CSAs are responsible for immediately reporting crimes and incidents that occur on the UC Santa Cruz campus or affiliated property to the UC Santa Cruz Police Department. More information about CSA responsibility is located at UCSC's Jeanne Clery Campus Security Act webpage.

Annual Campus Security and Fire Safety Report

On October 1 of each year, an email notification is sent to all enrolled students and to academic and staff personnel, providing the website to access the **Campus Security and Fire Safety Report**. This report includes statistics for the previous three years concerning reported crimes that occurred on campus; in certain off-campus buildings or property owned or controlled by UC Santa Cruz; and on public property within, or immediately adjacent to and accessible from, the campus.

The report also includes information on fire protection systems, fire prevention policies, as well as institutional policies concerning other safety and security matters. You can obtain a copy of this report by contacting the UC Santa Cruz Police Department, 1156 High Street, Santa Cruz, CA 95064, (831) 459-2231, or at the Police Department website.

The UC Santa Cruz Police Department submits the annual crime and fire statistics published in this report to the Department of Education. The statistical information gathered by the Department of Education is available to the public through the Department of Education website.

Consequences for Non-Compliance with the Clery Act

Possible consequences for an institution's non-compliance with the Clery Act include:

- A suspension or limiting of the institutions Title IV funding;
- The Department of Education may issue a civil fine up to \$35,000 per violation;
- The institution may suffer reputational loss due to negative media attention;
- Failure to comply with the Clery Act can be used in various litigation matters.

Increased Safety Measures and Safeguards

Pursuant to California Education Code section 67380, each UC campus is required to provide information regarding special safeguards that have been established for particular facilities or activities in the preceding 18 months to increase safety, and any

changes in safety precautions expected to be made during the future 24 months.

The following programs or safeguards have been or will be instituted:

- Increased Police Student Ambassador Patrols and Safe Rides App
- Increased safety education and training, including Community Response to Workplace Violence and Active Shooter Incidents.
- Environmental Health and Safety safeguards and improvements
- Increased VHF radio and WiFi coverage on the campus
- Implementation of new tools for navigating the campus

Increased Police Student Ambassador Patrols

The UC Santa Cruz Police Student Ambassador program provides walking and vehicular crime prevention patrols at the Coastal Biology Campus (Long Marine Lab) and at McHenry Library. These patrols have assisted in enforcement of the campus smoking policy, non-research animal policy, and with other efforts to deter criminal activity in these locations. They also provide security at events and locations on the campus upon request. For more information, send an email to police@ucsc.edu.

Night Safety Escort Service—Safe Ride App

The UC Santa Cruz Police Department offers members of the community the ability to request a "Safe Ride" (free transportation from one location on campus to another) using their smart phones. Police Student Ambassadors, who manage the Night Safety Escort Program, provide the "Safe Ride" from 7:00 p.m. to 12:15 a.m., Monday through Thursday when classes are in session (except Summer Session).

Individuals may request a ride by downloading the TapRide application on their mobile device, and select University of California, Santa Cruz, Safe Ride program. They will be prompted to use their UC Santa Cruz credentials to log in and request a ride. Individuals may also request a ride during these hours by calling the dispatch center at (831) 459-2100. **There may be exceptions for holidays and finals week.**

This program is not intended to replace existing transportation services such as the Metro Bus and Campus Shuttles or to discourage individuals from walking in groups, but is intended to provide a safe and reliable means of transit from one location to another on the campus. The Night Safety Escort Program cannot provide escort services to or from off-campus locations.

Intoxicated and/or disorderly students will not be transported, nor is food or alcohol allowed in the shuttle. The Police Student Ambassadors reserve the right to refuse transport. Additionally, the Police Student Ambassadors may provide walking escorts in lieu of using a vehicle.

Tools for Navigating the UC Santa Cruz

Campus

The Wayfinding Workgroup seeks to improve the tools available for navigating the campus. Over the past 18 months, it has worked on improving temporary signage, recommended improvements to the campus entrance, and developed a pilot project in the Science Hill area. Over the next two years, the group's tasks include writing a campus policy on signage and developing outreach to inform campus constituents about the best ways to direct people to specific locations.

The campus is also in the process of developing a Master Pedestrian Plan to promote walking as the most sustainable way to traverse the campus. The final plan will include an assessment of existing conditions, including gaps in the pedestrian infrastructure, and a plan to create a more pedestrian-friendly campus.

In a parallel effort, Transportation and Parking Services (TAPS) is revising the information posted at each transit stop, including an overall map of the campus, and an enlarged map of the half-mile radius surrounding each stop. TAPS has also launched a bus tracking system app (developed in conjunction with the campus Computer Science Department) that allows riders to see each active campus shuttle in real time on a campus map.

Drug-Free Schools and Communities Act

In compliance with the federal Drug-Free Schools and Communities Act, UC Santa Cruz annually notifies students, faculty, and staff of policies, procedures, and potential consequences related to unlawful possession, use, or distribution of drugs and alcohol on campus. This notice is distributed to students through the colleges and the Graduate Studies Division, and to faculty and staff via email. The university also conducts a biannual review of programs related to drugs and alcohol to determine effectiveness, implement changes, and ensure that disciplinary sanctions are consistently enforced. This review is coordinated by the Dean of Students Office. For information, email deanofstudents@ucsc.edu.

Smoking on Campus Policy

The University of California is smoke and tobacco-free at all campus locations. The use of marijuana is prohibited under federal regulations. Use of all forms of tobacco, including smokeless tobacco products and unregulated nicotine products (e.g. "e-cigarettes"), is strictly prohibited within the boundaries of university-controlled properties, including parking lots. Assistance to students, faculty, and staff to overcome addiction to tobacco, nicotine, or marijuana products is also available through the UC health and benefits plans, Faculty/Staff Wellness Programs, Student Health Center, Faculty Staff Assistance Programs (FSAP), and Counseling Center. For more detailed information about the policy, help quitting, and other resources, see the UCSC Smoke and Tobacco-Free website.

Graduate Student–Faculty Adviser Relationship Guidelines

The University of California, Santa Cruz, expects professional, fair, and frequent communication between graduate students

and their advisers. Open communication and mutual respect should be the foundation of the relationship between a graduate student and faculty adviser. The graduate adviser and the graduate student should discuss their student-adviser relationship early, and clearly communicate mutual and agreeable expectations from the beginning. Regular interactions, especially face-to-face meetings, are essential in ensuring that expectations and goals are met.

In an optimal learning environment, the faculty adviser should provide timely and constructive feedback on performance and expectations; timely and sufficient warning of inadequate performance; appropriate recognition of a student's intellectual contributions; and academic and professional advice on all stages of the graduate career. The graduate student should be an active participant in seeking advice and getting feedback on progress, keeping the faculty adviser informed of plans, progress, and obstacles, and contributing during regular progress assessments. The faculty adviser and the student each have the duty and responsibility to initiate meetings as necessary to foster and protect the success of the relationship.

Professionalism and fairness should guide the graduate student–faculty adviser relationship. Graduate students and faculty should avoid relationships that conflict with their particular roles and responsibilities. Faculty advisers and graduate students are bound by policies that prohibit discrimination and harassment. Graduate students may be entitled to accommodations under the Americans with Disabilities Act. (See Appendix E: Policies and Regulations and Nondiscrimination and Affirmative Action Policies (p. 1261).) When concerns and conflicts arise, they should be raised and attended to professionally, honestly, and promptly. Retaliation and discrimination against students for raising concerns are prohibited.

If something happens that upsets the faculty adviser–graduate student relationship and cannot be resolved either by direct or indirect discussion, a graduate student can seek assistance from a trusted faculty member, the dean of graduate studies, the graduate director, the department chair, conflict resolution, counseling and psychological services, and/or the Title IX Office. Graduate students may request confidentiality. Many departments have developed processes to address a range of potential concerns. For information about grievance and appeal procedures, see Appendix E: Policies and Regulations and Nondiscrimination and Affirmative Action Policies (p. 1261). For a description of additional informal and formal grievance and appeal processes available to UCSC graduate students, please refer to the Graduate Student Handbook.

Student Conduct and Community Standards

A comprehensive list of student policies and codes of conduct is available online: Student Policies and Regulations Handbook. The Student Policies and Regulations Handbook is also available in alternate formats from the Student Conduct and Community Standards Office.

The Student Conduct and Community Standards Office is responsible for the adjudication of nonacademic student and student organization misconduct for UCSC. In this capacity, Student Conduct and Community Standards administers the

Code of Student Conduct in accordance with Section 100.00 of the Student Policies and Regulations Handbook. Allegations of misconduct may be brought by students, faculty, staff, police, visitors to the campus, and members of the community. Incident reports may be made by submitting a report at the Conduct and Community Standards webpage.

The Student Conduct and Community Standards Office is located in 245 Hahn Student Services and can be reached by phone at (831) 459-1738, by fax at 459-3188, or via email at conduct@ucsc.edu. During remote instruction in-person meetings and fax use will be suspended; all services provided remotely by phone by calling (831) 459-4446 or (831) 459-4446, or by email at counduct@ucsc.edu.

Nondiscrimination and Affirmative Action Policies

In this section:

Student-related matters (p. 1261)

Employment-related matters (p. 1261)

Sexual harassment and sexual violence/Title IX (p. 1262)

Student-Related Matters

The University of California, in accordance with applicable federal and state law and university policy, does not discriminate on the basis of race, color, national origin, religion, sex, gender, gender identity, gender expression, pregnancy*, physical, mental health or cognitive disability, medical condition (cancer-related or genetic characteristics), genetic information, ancestry, marital status, age, sexual orientation, citizenship, or service in the uniformed services. The university also prohibits sexual harassment.

This nondiscrimination policy covers admission, access, and treatment in university programs and activities.

Inquiries regarding the university's student-related nondiscrimination policies may be directed to Conduct and Community Standards, (831) 459-1738, or email conduct@ucsc.edu.

Inquiries regarding the university's affirmative action, equal employment opportunity, and nondiscrimination policies as they relate to student employment may be directed to Sonjé Dayries, JD at the Office for Diversity, Equity, and Inclusion: 831-459-2686 or email or email sdayries@ucsc.edu.

Inquiries regarding the UC Policy on Sexual Violence and Sexual Harassment and UC Santa Cruz Procedures for Reporting and Responding to Reports of Sexual Violence and Sexual Harassment and/or any other violations of Title IX (sex/gender discrimination; harassment or discrimination based on sexual orientation, gender identity, gender expression, or pregnancy) may be directed to Title IX Officer Isabel Dees, (831) 459-2462, or email idees@ucsc.edu.

Student inquiries regarding disability or disability accommodations may be addressed to the Disability Resource Center, (831) 459-2089; or email drc@ucsc.edu.

Students with disabilities who are unable to resolve accommodation or discrimination concerns may contact the campus ADA compliance officer by phone, (831) 459-2295, or email wkidder@ucsc.edu.

*Pregnancy includes pregnancy, childbirth, and medical conditions related to pregnancy or childbirth.

Employment-Related Matters

The University of California is committed to providing a workplace free of discrimination and harassment. The university prohibits discrimination against any person employed; seeking employment; or applying for or engaged in a paid or unpaid internship or training program leading to employment with the University of California. In addition, the university prohibits harassment of an employee, applicant, paid or unpaid intern, volunteer, person participating in a program leading to employment, or person providing services pursuant to a contract. The university undertakes affirmative action, consistent with its obligations as a federal contractor. The University of California is an Equal Opportunity/Affirmative Action Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, disability, age or protected veteran status.

The university prohibits discrimination against any person employed; seeking employment; or applying for or engaged in a paid or unpaid internship or training program leading to employment with the University of California on the basis of race, color, national origin, religion, sex, gender, gender expression, gender identity, gender transition status, pregnancy¹, physical, mental health or cognitive disability, medical condition (cancer-related or genetic characteristics), genetic information (including family medical history), ancestry, marital status, age, sexual orientation, citizenship, or service in the uniformed services², including protected veterans. This policy applies to all employment practices, including recruitment, selection, promotion, transfer, merit increase, salary, training and development, demotion, and separation.

In addition, the university prohibits harassment based on the above protected characteristics of an employee, applicant, paid or unpaid intern, volunteer, person participating in a program leading to employment, or person providing services pursuant to a contract.

If the harassment is sexual in nature, the university's Sexual Violence and Sexual Harassment (SVSH) policy will apply. Local SVSH resource information can be found at the UC Sexual Violence Prevention and Response website.

University policy prohibits retaliation for bringing a complaint of discrimination or harassment pursuant to this policy against any person employed; seeking employment; providing services pursuant to a contract; or applying for or engaged in a paid or unpaid internship, volunteer capacity, or training program leading to employment with the University of California. This policy also prohibits retaliation against a person who assists someone with a complaint of discrimination or harassment, or participates in any manner in an investigation or resolution of a complaint of discrimination or harassment. Retaliation includes

threats, intimidation, reprisals, and/or adverse actions related to employment.

While absolute confidentiality cannot be promised, those hearing and investigating discrimination and harassment complaints apply a strict business need-to-know standard when sharing or disclosing information as needed to conduct an investigation, to work toward a resolution, and as university policy, campus policy, and state or federal law dictate. We ask that all involved parties maintain an appropriate level of confidentiality.

UC Santa Cruz maintains comprehensive complaint processes to address discrimination and harassment concerns to ensure that appropriate confidentiality is maintained; that reporters and responding parties receive timely responses; that investigations are conducted in a timely fashion by impartial, qualified personnel; systems are in place for documenting and tracking progress; and that appropriate remedial actions and resolutions are offered.

University policy is intended to be consistent with the provisions of applicable state and federal laws.

Inquiries regarding the university's affirmative action, equal employment opportunity, and harassment and nondiscrimination policies for academic, staff and student employment may be directed to Sonjé Dayries, JD at the Office for Diversity, Equity, and Inclusion, 831-459-2686 or email sdaryries@ucsc.edu.

NOTES:

1. **Pregnancy** includes pregnancy, childbirth, and medical conditions related to pregnancy or childbirth.
2. **Service in the uniformed services** includes membership, application for membership, performance of service, application for service, or obligation for service in the uniformed services.

Sexual Harassment and Sexual Violence Title IX

The University of California cherishes the free and open exchange of ideas and expansion of knowledge. Maintaining this freedom and openness requires objectivity, mutual trust, and confidence; it requires the absence of coercion, intimidation, or exploitation. The principal responsibility for maintaining these conditions must rest upon those members of the university community who exercise the greatest authority and leadership: faculty, managers, and supervisors.

The university has therefore instituted a number of measures designed to protect the campus community from sexual harassment and sexual violence. Students, faculty, and staff who would like information or a consultation about gender-based discrimination, sexual harassment, or sexual violence; would like to understand resources and reporting options; would like to file a formal complaint; would like to request a training session; and/or would like copies of the UC Policy on Sexual Violence and Sexual Harassment and/or the UC Santa Cruz Procedures for Reporting and Responding to Reports of

Sexual Violence and Sexual Harassment may consult the Title IX Office website or contact Isabel Dees, Title IX Officer, at (831) 459-2462, or via email at idees@ucsc.edu. Individuals seeking additional resources and information regarding rights and reporting options for those impacted by sexual harassment and sexual violence may also consult the CARE website.

TEACHING AND ADMINISTRATIVE STAFF

2020-21 UCSC Faculty

Faculty titles for 2020-21 were verified as of June 26, 2020, and subsequent changes may not be reflected in the following list. Please note that inclusion in this list is not a guarantee that the faculty member will be teaching throughout the 2020–21 academic year. In addition, some faculty listed here as emeriti may be recalled to teach courses.

The listing for most faculty members includes college membership, year of arrival at UC Santa Cruz, and academic title.

University of California and UC Santa Cruz Administration (p. 1284)

Jasmine	Alinder	Professor	History
Suzanne	Alonzo	Professor	Ecology and Evolutionary Biology
Nathan	Altice	Assistant Teaching Professor	Computational Media
Wolfgang	Altmannshofer	Assistant Professor	Physics
Peter	Alvaro	Associate Professor	Computer Science and Engineering
Mark	Amengual	Associate Professor	Languages and Applied Linguistics
Margaret	Amis	Lecturer Continuing	Writing Program
Pranav	Anand	Professor	Linguistics
Mark	Anderson	Professor	Anthropology
Elliot	Anderson	Associate Professor	Art
Lawrence	Andrews	Professor	Film and Digital Media
Hillary	Angelo	Associate Professor	Sociology
David H	Anthony III	Associate Professor	History
Cameron	Archer	Lecturer Continuing	Film and Digital Media
Sondra	Archimedes	Lecturer Continuing	Writing Program
Owen	Arden	Assistant Professor	Computer Science and Engineering
Anjali	Arondekar	Associate Professor	Feminist Studies
Gabriela	Arredondo	Associate Professor	Latin American and Latino

2021-22 UCSC FACULTY

First Name	Last Name	Title	Department
Shiva	Abbaszadeh	Assistant Professor	Electrical and Computer Engineering
Sara	Abrahamsson	Assistant Professor	Electrical and Computer Engineering
Zsuzsanna	Abrams	Professor	Languages and Applied Linguistics
Elizabeth	Abrams	Teaching Professor	Writing Program
James	Ackman	Assistant Professor	"Molecular, Cell, and Developmental Biology"
Anthony	Aguirre	Professor	Physics
Neel	Ahuja	Professor	Feminist Studies
Mark	Akeson	Professor	Biomolecular Engineering
Nameera	Akhtar	Professor	Psychology
Jorge	Aladro Font	Professor	Literature
Peter	Aldhous	Lecturer Continuing	Science Communication
Marcela	Alfaro Córdoba	Assistant Teaching Professor	Statistics

Joshua	Arribere	Assistant Professor	Studies "Molecular, Cell, and Developmental Biology"	Scott	Beamer	Assistant Professor	Computer Science and Engineering
				Claudie	Beaulieu	Assistant Professor	Ocean Sciences
Derede	Arthur	Lecturer Continuing	Writing Program	Elizabeth	Beaumont	Associate Professor	Politics
Noriko	Aso	Associate Professor	History	Dorian	Bell	Associate Professor	Literature
Neda	Atanasoski	Professor	Feminist Studies	Roxanne	Beltran	Assistant Professor	Ecology and Evolutionary Biology
Alexander	Ayzner	Associate Professor	Chemistry and Biochemistry	Ilan	Benjamin	Professor	Chemistry and Biochemistry
Margarita	Azmitia	Professor	Psychology	Chris	Benner	Professor	Environmental Studies
Robert	Baden	Lecturer Continuing	Economics	Chris	Benner	Professor	Sociology
Delbert Dean	Bailey	Lecturer Continuing	Computer Science and Engineering	Ryan	Bennett	Associate Professor	Linguistics
Mark	Baker	Lecturer Continuing	Oakes College	Nathaniel	Berman	Lecturer Continuing	Music
Mark	Baker	Lecturer Continuing	Writing Program	Giacomo	Bernardi	Professor	Ecology and Evolutionary Biology
Lily	Balloffet	Associate Professor	Latin American and Latino Studies	David	Bernick	Lecturer Continuing	Biomolecular Engineering
Karen	Barad	Professor	Feminist Studies	Eva	Bertram	Associate Professor	Politics
Byron	Barahona	Lecturer Continuing	Languages and Applied Linguistics	Julie	Bettie	Associate Professor	Sociology
Ayse Banu	Bargu	Associate Professor	History of Consciousness	Needhi	Bhalla	Professor	"Molecular, Cell, and Developmental Biology"
Lora	Bartlett	Associate Professor	Education	Nandini	Bhattacharya	Lecturer Continuing	Mathematics
Natalie	Batalha	Professor	Astronomy and Astrophysics	Caitlin	Binder	Lecturer Continuing	Chemistry and Biochemistry
Frank	Bauerle	Teaching Professor	Mathematics	Josefina	Bittar Prieto	Acting Assistant	Languages and Applied
Amy	Beal	Professor	Music				

		Professor	Linguistics	Angela	Brooks	Associate Professor	Biomolecular Engineering
Hunter	Bivens	Associate Professor	Literature				
				Kyle	Bruckmann	Lecturer Continuing	Music
Terry	Blackburn	Assistant Professor	Earth & Planetary Sciences				
				Nicholas	Brummell	Professor	Applied Mathematics
Hinrich	Boeger	Professor	"Molecular, Cell, and Developmental Biology"	David	Brundage	Professor	History
				Heather	Bullock	Professor	Psychology
Robert	Boltje	Professor	Mathematics	George	Bulman	Associate Professor	Economics
Courtney	Bonam	Assistant Professor	Psychology				
				George	Bunch	Professor	Education
Douglas	Bonett	Professor	Psychology	Kevin	Bundy	Assistant Professor	Astronomy and Astrophysics
Guido	Bordignon	Assistant Teaching Professor	"Molecular, Cell, and Developmental Biology"				
				Jeffrey	Bury	Professor	Environmental Studies
Megan	Boudewyn	Assistant Professor	Psychology	Renee	Cailloux	Lecturer Continuing	Languages and Applied Linguistics
John	Bowin	Associate Professor	Philosophy				
				Melissa L.	Caldwell	Professor	Anthropology
David	Boyd	Assistant Professor	"Molecular, Cell, and Developmental Biology"	Maureen	Callanan	Professor	Psychology
				Candace	Calsoyas	Lecturer Continuing	Rachel Carson College
Scott	Brandt	Professor	Computer Science and Engineering				
				Caren	Camblin	Lecturer Continuing	Stevenson College
Kirsten	Brandt	Lecturer Continuing	Theater Arts				
				Elisabeth	Cameron	Professor	History of Art and Visual Culture
Rebecca	Braslau	Professor	Chemistry and Biochemistry				
				J. Elliott	Campbell	Professor	Environmental Studies
Adrian	Brasoveanu	Professor	Linguistics				
Anthony	Breakspear	Lecturer Continuing	Writing Program	Manel	Camps	Professor	Microbiology and Environmental
							Toxicology
Benjamin	Breen	Associate Professor	History				
				Alvaro	Cardenas	Associate Professor	Computer Science and Engineering
Gail	Brenner	Lecturer Continuing	Writing Program	micha	cárdenas	Assistant Professor	Arts Division
Emily	Brodsky	Professor	Earth & Planetary Sciences	Kim	Cardilla	Lecturer Continuing	Psychology

Catherine	Carlstroem	Lecturer Continuing	Cowell College	Yihsu	Chen	Professor	Electrical and Computer Engineering
Susan	Carpenter	Associate Professor	"Molecular, Cell, and Developmental Biology"	Chris	Chen	Associate Professor	Literature
Mark	Carr	Professor	Ecology and Evolutionary Biology	Bin	Chen	Professor	"Molecular, Cell, and Developmental Biology"
Benjamin	Carson	Associate Professor	Music	Weixin	Cheng	Professor	Environment al Studies
Elin	Carstendottir	Assistant Professor	Computational Media	Geoffrey	Childers	Lecturer Continuing	Stevenson College
Sue	Carter	Professor	Physics	Alan	Christy	Associate Professor	History
Saskias	Casanova	Assistant Professor	Psychology	Patrick	Chuang	Professor	Earth & Planetary Sciences
Gerald	Casel	Associate Professor	Theater Arts	Matthew	Clapham	Professor	Earth & Planetary Sciences
Carolina	Castillo Trelles	Lecturer Continuing	Languages and Applied Linguistics	Seshadhri	Comandur	Professor	Computer Science and Engineering
Raquel	Chamorro Garcia	Assistant Professor	Microbiology and Environmental Toxicology	Christopher	Connery	Professor	Literature
Shelly	Chan	Associate Professor	History	Paul	Contos	Lecturer Continuing	Music
Evangelos	Chatziafratis	Assistant Professor	Computer Science and Engineering	Ryan	Coonerty	Lecturer Continuing	Legal Studies
Yve	Chavez	Assistant Professor	History of Art and Visual Culture	Bruce	Cooperstein	Professor	Mathematics
Erika	Check Hayden	Assistant Teaching Professor	Physical & Biological Sciences Division	Vilashini	Cooppan	Professor	Literature
Michael	Chemers	Professor	Theater Arts	Russell	Corbett- Detig	Assistant Professor	Biomolecular Engineering
Nancy	Chen	Professor	Anthropology	Valerie	Cortez	Assistant Professor	"Molecular, Cell, and Developmental Biology"
Shaowei	Chen	Professor	Chemistry and Biochemistry	Keith	Corzine	Professor	Electrical and Computer Engineering
				Dan	Costa	Professor	Ecology and Evolutionary

William	Coulter	Lecturer Continuing	Biology Music	Ioannis	Demertzis	Assistant Professor	Computer Science and Engineering
Steven	Coulter	Lecturer Continuing	Writing Program	T.J.	Demos	Professor	History of Art and Visual Culture
Rebecca	Covarrubias	Associate Professor	Psychology	Gina	Dent	Associate Professor	Feminist Studies
Dan	Cristofaro- Gardiner	Assistant Professor	Mathematics	Jennifer	Derr	Associate Professor	History
Donald	Croll	Professor	Ecology and Evolutionary Biology	Subhas	Desa	Teaching Professor	Engineering School
David Lee	Cuthbert	Professor	Theater Arts	Nathaniel	Deutsch	Professor	History
Jon	Daehnke	Associate Professor	Anthropology	Joshua	Deutsch	Professor	Physics
Audun	Dahl	Associate Professor	Psychology	Martin	Devecka	Associate Professor	Literature
Yasmeen	Daifallah	Assistant Professor	Politics	Maria Elena	Diaz	Associate Professor	History
Sharon	Daniel	Professor	Film and Digital Media	Lindsey	Dillon	Assistant Professor	Sociology
A.M.	Darke	Assistant Professor	Arts Division	Janette	Dinishak	Associate Professor	Philosophy
Nicolas	Davidenko	Associate Professor	Psychology	Carlos	Dobkin	Professor	Economics
James	Davis	Professor	Computer Science and Engineering	Bryan	Donaldson	Associate Professor	Languages and Applied Linguistics
Muriam	Davis	Assistant Professor	History	Chongying	Dong	Professor	Mathematics
Luca	de Alfaro	Professor	Computer Science and Engineering	James	Doucet- Battle	Assistant Professor	Sociology
Roberto	de Roock	Assistant Professor	Education	David	Draper	Professor	Statistics
Lyndy	Dean	Professor	History of Art and Visual Culture	Rebecca	DuBois	Associate Professor	Biomolecular Engineering
Grace Peña	Delgado	Associate Professor	History	Robin	Dunkin	Assistant Teaching Professor	Ecology and Evolutionary Biology
				Kent	Eaton	Professor	Politics
				Kate	Edmunds	Professor	Theater Arts
				Christophe r	Edwards	Professor	Ocean Sciences
				Torsten	Ehrhardt	Professor	Mathematics

Dina	El Dessouky	Lecturer Continuing	Writing Program				Planetary Sciences
Gabriel	Elkaim	Professor	Electrical and Computer Engineering	Andy	Fisher	Professor	Earth & Planetary Sciences
Jonathan	Ellis	Associate Professor	Philosophy	Cormac	Flanagan	Professor	Computer Science and Engineering
Jeff	Erbig	Associate Professor	Latin American and Latino Studies	Jeffrey	Flanigan	Assistant Professor	Computer Science and Engineering
Alegra	Eroy-Reveles	Assistant Teaching Professor	Chemistry and Biochemistry	Ryan	Foley	Assistant Professor	Astronomy and Astrophysics
Maria	Evangelatou	Professor	History of Art and Visual Culture	Angus	Forbes	Associate Professor	Computational Media
Maria	Ezerova	Lecturer Continuing	Music	Camilla	Forsberg	Professor	Biomolecular Engineering
Madeleine	Fairbairn	Associate Professor	Environmental Studies	Jonathan	Fortney	Professor	Astronomy and Astrophysics
Robert	Fairlie	Professor	Economics	Laurel	Fox	Professor	Ecology and Evolutionary Biology
Sylvanna	Falcón	Associate Professor	Latin American and Latino Studies	Renee	Fox	Assistant Professor	Literature
Dion	Farquhar	Lecturer Continuing	Crown College	Jean	Fox Tree	Professor	Psychology
Lars	Fehren-Schmitz	Associate Professor	Anthropology	Carla	Freccero	Professor	Literature
David	Feldheim	Professor	"Molecular, Cell, and Developmental Biology"	Daniel	Fremont	Assistant Professor	Computer Science and Engineering
Nicole	Feldl	Assistant Professor	Earth & Planetary Sciences	Benjamin	Friedlander	Professor	Electrical and Computer Engineering
Mayanthi	Fernando	Associate Professor	Anthropology	Gregory	Fritsch	Lecturer Continuing	Theater Arts
Jerome	Fiechter	Assistant Professor	Ocean Sciences	Anna	Friz	Assistant Professor	Film and Digital Media
Noah	Finnegan	Professor	Earth &	Sakae	Fujita	Lecturer Continuing	Languages and Applied Linguistics
				Hiroshi	Fukurai	Professor	Sociology
				Kwok-Chiu	Fung	Professor	Economics
				Patricia	Gallagher	Professor	Theater Arts

Pascale	Garaud	Professor	Applied Mathematics	David	Gordon	Assistant Professor	Politics
Jose Joaquin	Garcia-Luna-Aceves	Professor	Computer Science and Engineering	Stefania	Gori	Assistant Professor	Physics
Ian	Garrick-Bethell	Professor	Earth & Planetary Sciences	Deborah	Gould	Associate Professor	Sociology
Jacqueline	Gehring	Associate Teaching Professor	Politics	Shelly	Grabe	Professor	Psychology
Lise	Getoor	Professor	Computer Science and Engineering	Chris	Gray	Lecturer Continuing	Crown College
Filippo	Gianferrari	Assistant Professor	Literature	Richard Edward	Green	Associate Professor	Biomolecular Engineering
Robert	Giges	Lecturer Continuing	Porter College	Miriam	Greenberg	Professor	Sociology
Greg	Gilbert	Professor	Environmental Studies	Jody	Greene	Professor	Literature
Susan	Gillman	Professor	Literature	Carol	Greider	Professor	"Molecular, Cell, and Developmental Biology"
Leilani	Gilpin	Assistant Professor	Computer Science and Engineering	Gary	Griggs	Professor	Earth & Planetary Sciences
Amy Mihyang	Ginther	Assistant Professor	Theater Arts	Kirsten Silva	Gruesz	Professor	Literature
Viktor	Ginzburg	Professor	Mathematics	Grace Weishi	Gu	Associate Professor	Economics
Laura	Giuliano	Professor	Economics	Daniel	Guevara	Professor	Philosophy
Ronald	Glass	Professor	Education	Puragra	Guha Thakurta	Professor	Astronomy and Astrophysics
Marcella	Gomez	Associate Professor	Applied Mathematics	Rajarshi	Guhaniyogi	Associate Professor	Statistics
Camilo	Gomez-Rivas	Associate Professor	Literature	Giulia	Gurun	Assistant Teaching Professor	"Molecular, Cell, and Developmental Biology"
Qi	Gong	Professor	Applied Mathematics	Irene	Gustafson	Associate Professor	Film and Digital Media
Julie	Gonzalez	Lecturer Continuing	Economics	Matthew	Guthaus	Professor	Computer Science and Engineering
Jennifer	Gonzalez	Professor	History of Art and Visual Culture	Julie	Guthman	Professor	Social Sciences Division
Maria Victoria	Gonzalez Pagani	Teaching Professor	Languages and Applied Linguistics	Kathleen	Gutierrez	Assistant	History

		Professor		Hannah	Hausman	Assistant Professor	Psychology
Melissa	Gwyn	Associate Professor	Art	David	Haussler	Professor	Biomolecular Engineering
M.	H. Astua	Lecturer Continuing	Writing Program	Camilla	Hawthorne	Assistant Professor	Sociology
Judith	Habicht-Mauche	Professor	Anthropology	Alma	Heckman	Associate Professor	History
Brent	Haddad	Professor	Environmental Studies	Charles	Hedrick	Professor	History
Joy	Hagen	Lecturer Continuing	Writing Program	Kimberly	Helmer	Associate Teaching Professor	Writing Program
Mathis	Hain	Assistant Professor	Earth & Planetary Sciences	Carla	Hernández Garavito	Assistant Professor	Anthropology
Dilek	Hakkani-Tur	Professor	Computer Science and Engineering	Karlton	Hester	Professor	Music
Abhishek	Halder	Assistant Professor	Applied Mathematics	Dee	Hibbert-Jones	Professor	Art
Galina	Hale	Professor	Economics	R. Soleste	Hilberg	Assistant Teaching Professor	Education
Erica	Halk	Lecturer Continuing	Writing Program	Joyce	Hill	Lecturer Continuing	Education
Charles	Hamilton	Lecturer Continuing	Music	Lindsay	Hinck	Professor	"Molecular, Cell, and Developmental Biology"
Roxanne	Hamilton	Lecturer Continuing	Writing Program	Karen	Holl	Professor	Environmental Studies
Phillip	Hammack	Professor	Psychology	Theodore	Holman	Professor	Chemistry and Biochemistry
Nicol	Hammond	Assistant Professor	Music	Christine	Hong	Associate Professor	Literature
Michael	Hance	Associate Professor	Physics	Jennifer	Horne	Associate Professor	Film and Digital Media
Craig	Haney	Professor	Psychology	Jeremy	Hourigan	Professor	Earth & Planetary Sciences
Jorge	Hankamer	Professor	Linguistics				
Jorge	Hankamer	Professor	Philosophy				
David	Harrison	Assistant Teaching Professor	Computer Science and Engineering	Liv	Hoversten	Assistant Professor	Psychology
Grant	Hartzog	Professor	"Molecular, Cell, and Developmental Biology"	Chenyue	Hu	Assistant Professor	Economics
				Minghui	Hu	Associate	History

		Professor		Naya Jones	Assistant Professor	Sociology
Richard	Hughey	Professor	Biomolecular Engineering	Vanessa Jonsson	Assistant Professor	Applied Mathematics
Richard	Hughey	Professor	Computer Science and Engineering	Isaac Julien	Acting Professor	Arts Division
Robin	Hunicke	Professor	Arts Division	Richard Jullig	Lecturer	Computer Science and Engineering
Michael	Hutchison	Professor	Economics		Continuing	
Nia	Imara	Assistant Professor	Astronomy and Astrophysics	Melissa Jurica	Professor	"Molecular, Cell, and Developmental Biology"
Erin	Irvine	Lecturer	Music			
		Continuing		Rohinton Kamakaka	Professor	"Molecular, Cell, and Developmental Biology"
Katherine	Isbister	Professor	Computational Media			
Junko	Ito	Professor	Linguistics	Stacy Kamehiro	Associate Professor	History of Art and Visual Culture
Kasia	Jankiewicz	Assistant Professor	Mathematics			
Tesla	Jeltema	Associate Professor	Physics	Sung-Mo "Steve" Kang	Professor	Electrical and Computer Engineering
Rebecca	Jensen-Clem	Assistant Professor	Astronomy and Astrophysics	Juhee Kang	Assistant Teaching Professor	Sociology
Rekia Gina	Jibrin	Assistant Professor	Education			
Sikina	Jinnah	Associate Professor	Environmental Studies	Anne Kapuscinski	Professor	Environmental Studies
Michael	John	Associate Teaching Professor	Computational Media	Karolina Karlic	Associate Professor	Art
				Kevin Karplus	Professor	Biomolecular Engineering
Janet	Johns	Lecturer	Education	Jesse Kass	Assistant Professor	Mathematics
		Continuing		Jonathan Katznelson	Lecturer	Applied Mathematics
Robert	Johnson	Professor	Physics			
Timothy	Johnstone	Assistant Professor	Chemistry and Biochemistry	Jonathan Katznelson	Lecturer	Statistics
		Continuing				
Kevin	Jones	Assistant Teaching Professor	Economics	Alan Kawamoto	Professor	Psychology
				Kathleen Kay	Associate Professor	Ecology and Evolutionary Biology
Catherine	Jones	Associate Professor	History			
				Edward Kehler	Lecturer	History
David Evan	Jones	Professor	Music		Continuing	

Edward	Kehler	Lecturer Continuing	Stevenson College			Continuing	Program
Sean	Keilen	Professor	Literature	Elise	Knittle	Professor	Earth & Planetary Sciences
Caitlin	Keliiaa	Assistant Professor	Feminist Studies	Nobuhiko	Kobayashi	Professor	Electrical and Computer Engineering
Douglas	Kellogg	Professor	"Molecular, Cell, and Developmental Biology"	Paul	Koch	Professor	Earth & Planetary Sciences
Jennifer	Kelly	Assistant Professor	Feminist Studies	Alexandra	Kolla	Assistant Professor	Computer Science and Engineering
Geri	Kerstiens	Assistant Teaching Professor	Chemistry and Biochemistry	Athanasios	Kottas	Professor	Statistics
Bruce	Kiesling	Assistant Professor	Music	Alejandra	Kramer	Lecturer Continuing	Anthropology
A. Marm	Kilpatrick	Professor	Ecology and Evolutionary Biology	Kristy	Kroeker	Associate Professor	Ecology and Evolutionary Biology
Daniel	Kim	Assistant Professor	Biomolecular Engineering	Raphael	Kudela	Professor	Ocean Sciences
Gueyon	Kim	Assistant Professor	Economics	Lindsey	Kuper	Assistant Professor	Computer Science and Engineering
L.S.	Kim	Associate Professor	Film and Digital Media	Sri	Kurniawan	Professor	Computational Media
Euiseok	Kim	Assistant Professor	"Molecular, Cell, and Developmental Biology"	Stephanie	Lain	Lecturer Continuing	Languages and Applied Linguistics
Hi Kyung	Kim	Professor	Music	Phoebe	Lam	Associate Professor	Ocean Sciences
Jacqueline	Kimmey	Assistant Professor	Microbiology and Environmental Toxicology	Carl	Lamborg	Associate Professor	Ocean Sciences
Robin	King	Lecturer Continuing	Oakes College	G. Allan	Langdale	Lecturer Continuing	History of Art and Visual Culture
Robin	King	Lecturer Continuing	Writing Program	Regina Day	Langhout	Professor	Psychology
Sharon	Kinoshita	Professor	Literature	Ruth	Langridge	Lecturer Continuing	Legal Studies
Kenneth	Kletzer	Professor	Economics				
Lindsay	Knisely	Lecturer Continuing	Oakes College	Cynthia	Larive	Professor	Chemistry and Biochemistry
Lindsay	Knisely	Lecturer	Writing				

Ingrid Moody	LaRiviere	Lecturer Continuing	Porter College			Teaching Professor	Developmental Biology"
				Herbert	Lee	Professor	Statistics
Ingrid Moody	LaRiviere	Lecturer Continuing	Writing Program	Ju Hee	Lee	Associate Professor	Statistics
Tracy	Larrabee	Professor	Computer Science and Engineering	Cynthia Ling	Lee	Associate Professor	Theater Arts
Matthew	Lasar	Lecturer Continuing	History	H Marshall	Leicester	Professor	Literature
				Fernando	Leiva	Professor	Latin American and Latino Studies
David	Lau	Lecturer Continuing	College Nine				
Kimberly	Lau	Professor	Literature	Michael	Leung	Associate Professor	Economics
Jess H.K.	Law	Assistant Professor	Linguistics				
Thorne	Lay	Professor	Earth & Planetary Sciences	Jonathan	Levitow	Lecturer Continuing	Languages and Applied Linguistics
				Cynthia	Lewis	Professor	Education
Chris	Lay	Lecturer Continuing	Environmental Studies	Debra	Lewis	Professor	Mathematics
				Yat	Li	Professor	Chemistry and Biochemistry
Natalia	Lazzati	Associate Professor	Economics				
				Jessie	Li	Assistant Professor	Economics
Enrique	Leal	Associate Professor	Art	Zehang	Li	Assistant Professor	Statistics
John Jota	Leaños	Professor	Film and Digital Media	Peter	Limbrick	Professor	Film and Digital Media
Campbell	Leeper	Professor	Psychology	Longzhi	Lin	Associate Professor	Mathematics
Alexie	Leauthaud	Associate Professor	Astronomy and Astrophysics				
				Heiner	Litz	Assistant Professor	Computer Science and Engineering
Marisol	LeBrón	Associate Professor	Feminist Studies				
				Yang	Liu	Assistant Professor	Computer Science and Engineering
David	Lederman	Professor	Physics				
Dongwook	Lee	Associate Professor	Applied Mathematics	Xavier	Livermon	Associate Professor	Feminist Studies
Jimin	Lee	Professor	Art	Suresh	Lodha	Professor	Computer Science and Engineering
David	Lee	Assistant Professor	Computational Media				
Jeremy	Lee	Associate	"Molecular, Cell, and	Toby	Loeffler	Lecturer Continuing	Writing Program

		ng		Piero	Madau	Professor	Astronomy and Astrophysics
Sarah	Loerch	Assistant Professor	Chemistry and Biochemistry				
				Nidhi	Mahajan	Assistant Professor	Anthropology
Michael	Loik	Professor	Environmental Studies	Roy	Malan	Lecturer Continuing	Music
Scott	Lokey	Professor	Chemistry and Biochemistry				
				Sandra	Malone	Lecturer Continuing	Languages and Applied Linguistics
Rebecca	London	Associate Professor	Sociology				
				Adriana	Manago	Associate Professor	Psychology
Amy	Lonetree	Associate Professor	History				
				Roberto	Manduchi	Professor	Computer Science and Engineering
Darrell	Long	Professor	Engineering School				
				Baldo	Marinovic	Lecturer Continuing	Ecology and Evolutionary Biology
Philip	Longo	Lecturer Continuing	Writing Program				
				Justin	Marion	Professor	Economics
Leslie	Lopez	Lecturer Continuing	Oakes College	George	Marsh	Lecturer Continuing	Music
Kristian	Lopez Vargas	Assistant Professor	Economics				
				Daisy	Martin	Lecturer Continuing	Education
Todd	Lowe	Professor	Biomolecular Engineering				
				Laura	Martin	Lecturer Continuing	Porter College
Flora	Lu	Professor	Environmental Studies				
				Marco	Martinez-Galarce	Lecturer Continuing	Porter College
Robert	Lund	Professor	Statistics				
Brij	Lunine	Lecturer Continuing	Writing Program				
				Julian	Martinez-Iriarte	Assistant Professor	Economics
Irene	Lusztig	Professor	Film and Digital Media				
				Pradip	Mascharak	Professor	Chemistry and Biochemistry
Boreth	Ly	Associate Professor	History of Art and Visual Culture				
				Mark	Massoud	Professor	Politics
				Michael	Mateas	Professor	Computational Media
Bruce	Lyon	Professor	Ecology and Evolutionary Biology				
				Marc	Matera	Associate Professor	History
Wesley	Mackey	Lecturer Continuing	Computer Science and Engineering				
				Andrew	Mathews	Associate Professor	Anthropology
John	MacMillan	Professor	Chemistry and Biochemistry				
				Dean	Mathiowetz	Associate Professor	Politics

Claire	Max	Professor	Astronomy and Astrophysics			Continuing	
Matthew	McCarthy	Professor	Ocean Sciences	Adam	Millard-Ball	Associate Professor	Environmental Studies
Aims	McGuinness	Associate Professor	History	Ethan	Miller	Professor	Computer Science and Engineering
Steve	McGuire	Assistant Professor	Electrical and Computer Engineering	Don	Miller	Assistant Professor	Languages and Applied Linguistics
Grant	McGuire	Associate Professor	Linguistics	Glenn	Millhauser	Professor	Chemistry and Biochemistry
Steven	McKay	Associate Professor	Sociology	Dejan	Milutinovic	Professor	Electrical and Computer Engineering
Shaun	McKinnie	Assistant Professor	Chemistry and Biochemistry	Nick	Mitchell	Associate Professor	Feminist Studies
Rita	Mehta	Associate Professor	Ecology and Evolutionary Biology	Katharyne	Mitchell	Professor	Sociology
Aaron	Meininger	Lecturer Continuing	Economics	Sean	Monaghan	Lecturer Continuing	Art
Robert	Meister	Professor	Social Sciences Division	Francois	Monard	Associate Professor	Mathematics
Edward	Melcer	Assistant Professor	Computational Media	J. Cameron	Monroe	Professor	Anthropology
Bruno	Mendes	Lecturer Continuing	Applied Mathematics	Katie	Monsen	Lecturer Continuing	Environmental Studies
Bruno	Mendes	Lecturer Continuing	Statistics	Katie	Monsen	Lecturer Continuing	Social Sciences Division
Jorgge	Menna Barreto	Acting Assistant Professor	Art	Maywa	Montenegro	Assistant Professor	Environmental Studies
Tanya	Merchant	Associate Professor	Music	Megan	Moodie	Associate Professor	Anthropology
Sarah	Michals	Lecturer Continuing	Writing Program	Andrew	Moore	Professor	Ocean Sciences
Karen	Miga	Assistant Professor	Biomolecular Engineering	Pedro	Morales Almazan	Assistant Teaching Professor	Mathematics
Edward	Migliore	Lecturer	Mathematics	Jaimie	Morse	Assistant Professor	Sociology
				Thomas	Moschetti	Lecturer Continuing	Economics

Judit	Moschkovich	Professor	Education	Francis	Nimmo	Professor	Earth & Planetary Sciences
Eduardo	Mosqueda	Associate Professor	Education	Narges	Norouzi	Assistant Teaching Professor	Computer Science and Engineering
Gerald	Moulds	Lecturer Continuing	Computer Science and Engineering	Katia	Obraczka	Professor	Computer Science and Engineering
Soraya	Murray	Associate Professor	Film and Digital Media	Natalia	Ocampo-Peñuela	Assistant Professor	Environmental Studies
Derek	Murray	Professor	History of Art and Visual Culture	Marcia	Ochoa	Associate Professor	Feminist Studies
Ruth	Murray-Clay	Professor	Astronomy and Astrophysics	Vicky M.	Oelze	Assistant Professor	Anthropology
Madhavi	Murty	Assistant Professor	Feminist Studies	Matthew	O'Hara	Professor	History
John	Musacchio	Professor	Computer Science and Engineering	Scott	Oliver	Professor	Chemistry and Biochemistry
Albert	Narath	Assistant Professor	History of Art and Visual Culture	Brad	Olsen	Professor	Education
Onuttom	Narayan	Professor	Physics	Gregory	O'Malley	Associate Professor	History
Mark	Nash	Acting Professor	Arts Division	Nicoletta	Orlandi	Professor	Philosophy
Sagnik	Nath	Assistant Teaching Professor	Computer Science and Engineering	Karen	Ottemann	Professor	Microbiology and Environmental Toxicology
Dard	Neuman	Associate Professor	Music	Jaye	Padgett	Professor	Linguistics
Ellen	Newberry	Lecturer Continuing	Writing Program	Eric	Palkovacs	Professor	Ecology and Evolutionary Biology
Shawn	Nichols	Lecturer Continuing	Legal Studies	Laurie	Palmer	Professor	Art
Shawn	Nichols	Lecturer Continuing	Politics	Annapurna	Pandey	Lecturer Continuing	Anthropology
Sara	Niedzwiecki	Associate Professor	Politics	Alex	Pang	Professor	Computer Science and Engineering
Jason	Nielsen	Professor	Physics	Jennifer	Parker	Professor	Art
				Ingrid	Parker	Professor	Ecology and Evolutionary Biology
				Paul	Parker	Acting Assistant Professor	Statistics
				Sarah-	Parmeter	Lecturer	Writing

Hope		Continuing	Program				Sciences
Kyle	Parry	Assistant Professor	History of Art and Visual Culture	Yuan	Ping	Assistant Professor	Chemistry and Biochemistry
Leila	Parsa	Professor	Electrical and Computer Engineering	Patricia	Pinho	Associate Professor	Latin American and Latino Studies
Carrie	Partch	Professor	Chemistry and Biochemistry	Jarmila	Pittermann	Associate Professor	Ecology and Evolutionary Biology
Eleonora	Pasotti	Associate Professor	Politics	Juan Grant	Poblete	Professor	Literature
Benedict	Paten	Associate Professor	Biomolecular Engineering	Grant	Pogson	Professor	Ecology and Evolutionary Biology
Michael	Patnode	Assistant Professor	Microbiology and Environmental Toxicology	Pratigya	Polissar	Acting Associate Professor	Ocean Sciences
Kenneth	Pedrotti	Professor	Electrical and Computer Engineering	Kailani	Polzak	Assistant Professor	History of Art and Visual Culture
Juan	Pedroza	Assistant Professor	Sociology	Kai	Pommerenke	Lecturer Continuing	Economics
Ariel	Perez	Lecturer Continuing	Languages and Applied Linguistics	Stan	Poplin	Lecturer Continuing	Music
Justin	Perez	Assistant Professor	Latin American and Latino Studies	Eric	Porter	Professor	History
Micah	Perks	Professor	Literature	Eric	Porter	Professor	History of Consciousness
Katie	Perry	Lecturer Continuing	Art	Don	Potts	Professor	Ecology and Evolutionary Biology
Stephen	Petersen	Associate Teaching Professor	Electrical and Computer Engineering	Nader	Pourmand	Professor	Biomolecular Engineering
Josephine	Pham	Assistant Professor	Education	Raquel	Prado	Professor	Statistics
Stacy	Philpott	Professor	Environmental Studies	Christopher	Pratorius	Lecturer Continuing	Music
Tamara	Pico	Assistant Professor	Earth & Planetary	Rick	Prelinger	Professor	Film and Digital Media
				Maria	Prencipe	Lecturer Continuing	Languages and Applied Linguistics
				Xavier	Prochaska	Professor	Astronomy and

			Astrophysics	Alicia	Riley	Assistant Professor	Sociology
Stefano	Profumo	Professor	Physics				
Mary Beth	Pudup	Associate Professor	Social Sciences Division	Kathryn (Kate)	Ringland	Assistant Professor	Computational Media
				Steven	Ritz	Professor	Physics
Chen	Qian	Associate Professor	Computer Science and Engineering	Cecilia	Rivas	Associate Professor	Latin American and Latino Studies
Jie	Qing	Professor	Mathematics				
Andrew	Quinn	Acting Assistant Professor	Computer Science and Engineering	Brant	Robertson	Professor	Astronomy and Astrophysics
Eréndira	Quintana Morales	Assistant Professor	Anthropology	Dena	Robertson	Lecturer Continuing	Cowell College
Hannah	Raila	Assistant Teaching Professor	Psychology	Jonathan	Robinson	Associate Professor	Economics
Pete	Raimondi	Professor	Ecology and Evolutionary Biology	Constance	Rockosi	Professor	Astronomy and Astrophysics
Ravi	Rajan	Professor	Environmental Studies	Russell	Rodriguez	Assistant Professor	Music
Renya	Ramirez	Professor	Anthropology	Pamela	Rodriguez-Montero	Acting Assistant Professor	Theater Arts
Catherine S.	Ramirez	Professor	Latin American and Latino Studies	Barbara	Rogoff	Professor	Psychology
				Randa	Roland	Lecturer Continuing	Chemistry and Biochemistry
Arthur	Ramirez	Professor	Physics				
Enrico	Ramirez-Ruiz	Professor	Astronomy and Astrophysics	Marco	Rolandi	Professor	Electrical and Computer Engineering
Jevgenij	Raskatov	Associate Professor	Chemistry and Biochemistry	Richard	Roper	Lecturer Continuing	Music
Annalisa	Rava	Lecturer Continuing	Writing Program	Paul Andrew	Roth	Professor	Philosophy
Christina	Ravelo	Professor	Ocean Sciences	Wendy	Rothwell	Lecturer Continuing	Biomolecular Engineering
Benjamin	Read	Professor	Politics				
Jenny	Reardon	Professor	Sociology	Seth	Rubin	Professor	Chemistry and Biochemistry
Jose	Renau	Professor	Computer Science and Engineering				
				Susana	Ruiz	Assistant Professor	Film and Digital Media
Zouheir	Rezki	Assistant Professor	Electrical and Computer Engineering	Vanessa	Ruotolo	Lecturer Continuing	Music

Samuel	Severance	Professor	al Studies	Kiva	Silver	Lecturer	Stevenson College
		Assistant Professor	Education			Continuing	
Travis	Seymour	Associate Professor	Psychology	Kiva	Silver	Lecturer	Writing Program
						Continuing	
Juned	Shaikh	Associate Professor	History	Emily	Sinclair	Lecturer	Music
						Continuing	
Savannah	Shange-Binion	Assistant Professor	Anthropology	Bakthan	Singaram	Professor	Chemistry and Biochemistry
Edward	Shanken	Associate Professor	Arts Division	Nirvikar	Singh	Professor	Economics
				Marilou	Sison Mangus	Assistant Professor	Ocean Sciences
Beth	Shapiro	Professor	Ecology and Evolutionary Biology	Andrew	Skemer	Associate Professor	Astronomy and Astrophysics
Helen	Shapiro	Associate Professor	Sociology	Graeme	Smith	Professor	Astronomy and Astrophysics
Ali	Shariati	Assistant Professor	Biomolecular Engineering	Adam	Smith	Assistant Professor	Computational Media
Upasna	Sharma	Assistant Professor	"Molecular, Cell, and Developmental Biology"	Amanda	Smith	Assistant Professor	Literature
B. Sriram	Shastry	Professor	Physics	Donald	Smith	Professor	Microbiology and Environmental Toxicology
David	Shaw	Lecturer	Kresge College				
		Continuing					
Heather	Shearer	Associate Teaching Professor	Writing Program	David	Smith	Professor	Physics
				Susan	Solt	Professor	Theater Arts
				Tyler	Sorensen	Assistant Professor	Computer Science and Engineering
Carol	Shennan	Professor	Environmental Studies				
				Matthew	Sparke	Professor	Politics
Ajay	Shenoy	Associate Professor	Economics	Alan	Spearot	Associate Professor	Economics
Alexander	Sher	Professor	Physics	Melanie	Springer	Associate Professor	Politics
Ivy	Sichel	Associate Professor	Linguistics				
				Shelley	Stamp	Professor	Film and Digital Media
Shaheen	Sikandar	Assistant Professor	"Molecular, Cell, and Developmental Biology"	Galia	Stein-Rosen	Lecturer	Languages and Applied Linguistics
						Continuing	
Denise	Silva	Lecturer	Writing Program	Elizabeth	Stephens	Professor	Art
		Continuing					

Michael	Stone	Professor	Chemistry and Biochemistry	Patrick	Tantalo	Lecturer Continuing	Computer Science and Engineering
Victoria	Stone	Professor	Microbiology and Environmental Toxicology	Jennifer	Taylor	Associate Professor	Film and Digital Media
Abe	Stone	Associate Professor	Philosophy	Avi	Tchamni	Lecturer Continuing	Music
Benjamin	Storm	Associate Professor	Psychology	Kip	Téllez	Professor	Education
Susan	Strome	Professor	"Molecular, Cell, and Developmental Biology"	Myriam	Telus	Assistant Professor	Earth & Planetary Sciences
Joshua	Stuart	Professor	Biomolecular Engineering	Mircea	Teodorescu	Associate Professor	Electrical and Computer Engineering
Norman	Su	Associate Professor	Computational Media	Terry	Terhaar	Lecturer Continuing	Writing Program
Junecue	Suh	Associate Professor	Mathematics	Veronica	Terriquez	Associate Professor	Sociology
Elaine	Sullivan	Associate Professor	History	Kirtana	Thangavelu	Lecturer Continuing	History of Art and Visual Culture
William	Sullivan	Professor	"Molecular, Cell, and Developmental Biology"	Megan	Thomas	Associate Professor	Politics
Undang	Sumarna	Teaching Professor	Music	John	Thompson	Professor	Ecology and Evolutionary Biology
Elizabeth	Swensen	Assistant Professor	Arts Division	Bruce	Thompson	Lecturer Continuing	History
Sergey	Syzranov	Assistant Professor	Physics	Bruce	Thompson	Lecturer Continuing	Literature
Jessica	Taft	Professor	Latin American and Latino Studies	David	Thorn	Lecturer Continuing	Writing Program
Leila	Takayama	Associate Professor	Computational Media	Massimiliano	Tomba	Acting Professor	History of Consciousness
Hiroataka	Tamanoi	Professor	Mathematics	Maziar	Toosarvandani	Associate Professor	Linguistics
John	Tamkun	Professor	"Molecular, Cell, and Developmental Biology"	Nina	Treadwell	Professor	Music
				Anthony	Tromba	Professor	Mathematics

Jennifer	Tseng	Assistant Professor	Literature	Marilyn	Walker	Professor	Computer Science and Engineering
Gerelt	Tserenjigmid	Assistant Professor	Economics	Rachel	Walker	Professor	Linguistics
Anna	Tsing	Professor	Anthropology	Hongyun	Wang	Professor	Applied Mathematics
Slawek	Tulaczyk	Professor	Earth & Planetary Sciences	Xin	Wang	Assistant Professor	Computer Science and Engineering
E. Hande	Tuna	Assistant Professor	Philosophy	Yiman	Wang	Professor	Film and Digital Media
Gina	Ulysse	Professor	Feminist Studies	Zhu	Wang	Associate Professor	"Molecular, Cell, and Developmental Biology"
Natasha	V.	Lecturer Continuing	Film and Digital Media	Su-hua	Wang	Professor	Psychology
Allen	Van Gelder	Professor	Computer Science and Engineering	Edward (Ted)	Warburton	Professor	Theater Arts
Anujan	Varma	Professor	Computer Science and Engineering	Jordan	Ward	Assistant Professor	"Molecular, Cell, and Developmental Biology"
Olena	Vaske	Assistant Professor	"Molecular, Cell, and Developmental Biology"	Noah	Wardrip-Fruin	Professor	Computational Media
Gustavo	Vazquez	Professor	Film and Digital Media	Susan	Watrous	Lecturer Continuing	Kresge College
Jairo	Velasco Jr.	Associate Professor	Physics	Susan	Watrous	Lecturer Continuing	Rachel Carson College
Daniele	Venturi	Associate Professor	Applied Mathematics	Marianne	Weems	Professor	Theater Arts
Anjuli	Verma	Assistant Professor	Politics	Michael	Wehner	Assistant Professor	Electrical and Computer Engineering
Amy	Vidali	Associate Teaching Professor	Writing Program	Dong	Wei	Assistant Professor	Economics
Luis Alonso	Villacorta Gonzales	Assistant Professor	Economics	Peter	Weiss	Lecturer Continuing	Chemistry and Biochemistry
Susan	Vollmer	Lecturer Continuing	Music	Marty	Weissman	Professor	Mathematics
Christopher	Vollmers	Associate Professor	Biomolecular Engineering	Jeremy	West	Assistant Professor	Economics
Matthew	Wagers	Professor	Linguistics	Marilyn	Westerkamp	Professor	History
				James	Whitehead	Professor	Computational Media
				Stephen	Whittaker	Professor	Computational Media

Sheila	Willey	Lecturer Continuing	Music	Aiming	Yan	Assistant Professor	Physics
Quentin	Williams	Professor	Earth & Planetary Sciences	Alice	Yang	Associate Professor	History
Terrie	Williams	Professor	Ecology and Evolutionary Biology	A. Ali	Yanik	Assistant Professor	Electrical and Computer Engineering
Franklin	Williams	Lecturer Continuing	Kresge College	Fitnat	Yildiz	Professor	Microbiology and Environmental Toxicology
Donald	Williams	Lecturer Continuing	Stevenson College	Chris	Yonge	Lecturer Continuing	Computational Media
Donald	Williams	Lecturer Continuing	Theater Arts	Gary	Young	Lecturer Continuing	Cowell College
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Rob	Wilson	Professor	Literature				
Ronaldo	Wilson	Professor	Literature				
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Tanner	WouldGo	Associate Teaching Professor	Writing Program	Jin	Zhang	Professor	Chemistry and Biochemistry
Ting Ting	Wu	Lecturer Continuing	Languages and Applied Linguistics	Yi	Zhang	Professor	Computer Science and Engineering
Cihang	Xie	Acting Assistant Professor	Computer Science and Engineering	Xi	Zhang	Associate Professor	Earth & Planetary Sciences
Naoko	Yamamoto	Lecturer Continuing	Languages and Applied Linguistics	Yu	Zhang	Assistant Professor	Electrical and Computer Engineering
Jeremy	Yamashiro	Assistant Professor	Psychology	Yuyin	Zhou	Assistant Professor	Computer Science and Engineering

Kai	Zhu	Associate Professor	Environmental Studies
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Ariel	Zucker	Assistant Professor	Economics
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Yi	Zuo	Professor	"Molecular, Cell, and Developmental Biology"
Eileen	Zurbruggen	Professor	Psychology
Eve	Zyzik	Professor	Languages and Applied Linguistics

2021-22 ADMINISTRATION

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The president of the university is the chief executive of the 10-campus system. He or she is appointed by the Regents and is directly responsible to them.

Each of the 10 campuses of the university has a chancellor, its chief administrative officer, who is responsible for the organization and operation of the campus, including academic, student, and business affairs.

The Academic Senate, consisting of the faculty and certain administrative officers, determines the conditions for admission and degrees, subject to the approval of the Regents; authorizes and supervises courses and curricula; and advises the university administration on important matters such as appointments and promotions, budgets, student discipline, and administration of the library.

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